NINETY-FOURTH ANNUAL REPORT

THE AMERICAN MUSEUM OF NATURAL HISTORY

JULY, 1962, THROUGH JUNE, 1963

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THE CITY OF NEW YORK
1963

NINETY-FOURTH 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

If it is fair to accept attendance as an indication that our Museum continues to fulfill its principal responsibility—educating the public in natural science—it is then fair to say that we have completed a most satisfactory year. During the fiscal period here reported on, 2,442,977 people visited the Museum, and 618,771 visited the Planetarium, making a combined total of 3,061,748. This figure, which represents an increase of 153,294 over the combined attendance for the preceding fiscal year, reflects the increasing public interest in science. The Hall of the Biology of Man and the exhibit of Man in Space were the newer displays that attracted attention and, of course, such long-standing favorites as the Akeley Memorial Hall of African Mammals, the Halls of North American Mammals and Forests, the Whitney Hall of Pacific Birds, and the dinosaur halls continued to draw visitors of all ages, from nearby and distant places.

It is encouraging to report that the Museum closed its books this year with the smallest deficit that we have had in five years. In fact, over the period of the past four years our deficit has been held to less than two per cent of our operating budget. This accomplishment, in the face of an upward trend in operating costs, is a clear indication of an understanding cooperation between the administration and the staff in the use of

budgetary funds which are provided for the various activities and functions of the Museum.

Our relationship with the City of New York may be described as a strong partnership and it is one of which we are proud. Since the founding of the Museum, farsighted city administrations have strengthened this relationship, providing a continuing and substantial source of financial support.

Increased activity and excellent results marked this year's fund-raising program. Mr. Peter M. Flanigan, Chairman of the Men's Committee, and Mrs. Francis H. Low, Chairman of the Women's Committee, and her Vice Chairmen, Mrs. Alfred Lee Loomis, Jr., and Mrs. Constantine Sidamon-Eristoff, recorded 2465 contributions, for a record total of $230,381. We are grateful to that growing number of friends of the Museum who so generously support our program.

One of the most significant aspects of this year's effort was the increase in the number of new contributors, both individuals and business organizations. The two committees also played important roles in making known the Museum's need for state aid. Toward the end of the last session of the New York State Legislature, a bill was introduced to provide financial assistance to the museums of the state. This bill did not come to a vote, but the measure will be reintroduced, and we are hopeful that it will ultimately be passed.

Over the years, our Museum and the National Geographic Society have been interested in exploring the frontiers of knowledge and in encouraging the men who set out to penetrate them. This spring, in honor of the seventy-fifth anniversary of the Society, we collaborated by preparing a special exhibit, "Partners in Discovery," to highlight the undertakings that we have shared. This exhibit was opened June 18 and will be continued through January, 1964.

The weekly radio program of the Museum, "Journey Into Nature," produced by WNBC, is now in its fourth year and continues to evoke an enthusiastic response from listeners.

Ably directed by Mr. Gary Stradling, the Sunday morning broadcasts provide an informal setting in which Museum scientists discuss their investigations, expeditions, and discoveries with an interested and knowledgeable layman, Mr. Tex Antoine. In the past year the program has explored a wide variety of topics, ranging from marine bio-acoustics to the prospects for interplanetary travel. We appreciate the time that has been so generously contributed by WNBC for these programs.

The publication program of the Museum, which has covered a wide range of interests, has been expanded still further with the inauguration of the Natural History Press, the division of Doubleday & Company, Inc., that was established to act as publisher for the Museum.

In the fall, the Natural History Press will begin publication at the Museum of a new magazine, entitled *Nature and Science*, for children from nine to fourteen years of age. This periodical is intended to meet the growing need of teachers, school administrators, and parents for appropriate science-appreciation materials for this age group. *Nature and Science* will carry out the purpose and considerably expand the function of *Junior Natural History*, which, during its 27 years of publication, introduced many thousands of youngsters to the phenomena of the natural world. With the launching of *Nature and Science*, publication of *Junior Natural History* has been discontinued.

Also scheduled for fall publication are the first four books in the new paperback series *American Museum Science Books*, and the first hardcover book to be published by the Press.

Natural History, our long-established adult magazine, continues to publish articles of high quality on the life and earth sciences. Circulation has been mounting steadily and has reached the all-time record of 138,000.

Now, to look ahead. In six years we shall celebrate our one-hundredth anniversary, and the preponderance of our plans point to that time. By 1969 we hope to round out our exhibition program with new halls devoted to ocean life, the biology

of invertebrates, the primates, the birds of North America, and the cultures of the Eastern Woodlands and Plains Indians, Eskimos, the peoples of Africa, and the peoples of the Pacific. The centennial program will culminate in the completion of the Hall of Earth History and Geology. The most recent scientific discoveries in each of these fields will be presented through the use of exhibition techniques for which this Museum is famous.

The exhibition halls of the Museum represent a distinctive medium of science education. Each exhibit bears the authoritative stamp of the Scientific Staff. Each draws on the Museum's invaluable collections and incorporates those objects and specimens that will most effectively interpret the concepts that are being taught. In these halls both children and adults study and learn, individually and in groups. People of all ages and at all stages of learning broaden their horizons, explore the unknown, study the known. Through the exhibition program the Museum makes one of its most significant contributions to the advancement of knowledge. To achieve our goals we need the support, and shall welcome the help, of the individuals, corporations, and foundations of our community.

We take pleasure in recording the addition of six new Trustees who joined our Board during the year. Mr. Kenneth Hyde Brownell, Mr. Rodney C. Gott, Mrs. Francis H. Low, Mrs. Alexander P. Morgan, and Mr. James F. Oates, Jr., were elected to the Board. Dr. Calvin E. Gross, who became Superintendent of New York City schools, is an *ex-officio* Trustee.

Alexander M. White

REPORT
OF THE DIRECTOR

Recent discussion concerning the establishment of a new museum of science in New York has called attention to some popular misconceptions about the nature and scope of science and, in particular, to a serious lack of understanding of what the term "natural history" embraces today.

The question "What is science?" has occupied the minds of thoughtful individuals for centuries. Any attempt to answer it comprehensively in a brief message would be folly, for it requires tracing the whole history of scientific thought. What is both possible and necessary, however, is to analyze the relationship of natural history to science and to cite the impressive contributions to science of the institution chartered as the American Museum of Natural History. The necessity is clearly demonstrated by the reported comment of a prominent public official who, in discussing plans for the new museum of science, lamented the fact that "New York has no science museum."

The word "science" is derived from the Latin word meaning "to know." The term "natural history," according to the "Oxford Universal Dictionary of Historical Principles," was first used in 1555 to define "a work dealing with the properties of natural objects, plants, or animals." At that time the definition covered man's observations of all the natural phenomena in his environment—from the earth and rocks beneath his feet, to the plant and animal life around him, to the stars. The definition continued in use and took on added meaning with the inventions of the telescope and the microscope, and with the great global explorations in the eighteenth and nineteenth centuries by men who were called not scientists, but naturalists.

As the studies and discoveries of the naturalists increased, new disciplines developed and new subdivisions of study grew within those disciplines. Fundamental to all the disciplines that grew up within the framework of natural history, however, was the concept of *observation.* This concept still remains the basis of science.

In essence, therefore, natural history is the mother of science. Thus, in 1869, it was logical and appropriate for the founders of this Museum to recognize the role of the great naturalists and to call the institution the American Museum of Natural History.

Since its founding, the Museum has played important roles on two frontiers of science: discovery and interpretation. The scientists contribute to the discovery of new knowledge through their original research and observations in the laboratory and in the field, through their work in studying, adding to, and curating the collections, and through their communication of new findings to colleagues in journals and at meetings. The Museum interprets science to the public through its broad programs of exhibition, public instruction, and popular publications which, as you will note in President White's report, are continually being enriched.

Today, this Museum has thirteen scientific departments; the full-time staff numbers 80 scientists. The activities of the Scientific Staff involve research into, and interpretation of, every major branch of the life and earth sciences. We have eleven departments engaged in research in the various biological, or life, sciences, including anthropology and animal behavior. Three of these departments combine the interests and techniques of biology and geology in their studies of vertebrate paleontology, invertebrate paleontology, and micropaleontology. In addition, the departments concerned with astronomy and mineralogy are working in those areas that are called the physical, or earth, sciences.

To fulfill its scientific role, the Museum maintains fully equipped research laboratories, specialized libraries, an exten-

sive publications program, and, of course, its invaluable collections. These collections contain actual specimens of most of the world's known present and past forms of animal life, its minerals and rare gems, and many of the archeological and ethnological materials that make it possible to reconstruct man's cultural history. Thus, the collections provide original material not only for Museum staff scientists, but for scholars throughout the world. The Museum provides working accommodations for the steady stream of visiting investigators who come from far and near to study the materials. In addition, and also at considerable expense, the Museum makes the collections available, on a loan basis, to qualified investigators. This loan system is a substantial contribution to the scientific research of many other institutions, particularly universities, which generally lack large collections.

The extent of scientific service performed by the scientists in a large museum for their colleagues elsewhere is seldom realized outside the museum. For example, a scientist working at a college where the library is limited requests the Department of Ornithology to supply him with additional bibliographic references on certain aspects of bird biology. The health department of a neighboring Latin American country asks our Department of Mammalogy to identify specimens of bats suspected of carrying rabies. The Department of Herpetology is called upon constantly to provide physicians with information on venomous snakes from specific regions of the world. And so it goes, in an infinite variety of inquiries, from aid on basic research to assistance in applied investigations.

In view of the increasingly critical shortage of trained scientists, notably in the fields in which the Museum is involved, it is noteworthy that the institution is making a substantial contribution to science through its training programs. These range from the informal orientation of qualified high school students to formal classes at the college level and on to specialized work with candidates for the doctoral degree. The programs are car-

ried out in many ways and are supported from many different sources.

In this connection, it is interesting to note that the Museum, a non-profit institution which must continually seek support for its activities, is—at the same time—a granting agency which sponsors many programs in support of scientific research and training. Funds for these programs come from restricted endowments given to the Museum for specific purposes and from grants from the Federal Government. These grants result from the widespread recognition the Museum has achieved as an institution of outstanding research capability, well qualified to administer such endowments. Thus, we administer the Ogden Mills Fellowships for research in anthropology, the Frank M. Chapman Memorial Fund Fellowships and Awards in ornithology, the Leonard C. Sanford trusts in ornithology, the Theodore Roosevelt Memorial Fund awards for research on the wildlife of North America, and the Lincoln Ellsworth Fund for the training and indoctrination of young scientists. In addition, we are the recipient of grants from the National Science Foundation for research training of high school, undergraduate, and graduate students in various branches of the life and physical sciences.

The Museum also has four field research stations that provide unique facilities for the support of scientific investigations both for our own staff and for representatives of institutions in many parts of the world. The studies conducted at these stations cover a wide range of scientific inquiry, from medicine to astronomy, biophysics to vegetation studies, and include both behavioral and taxonomic investigations.

The leadership and professional activities of the staff in other scientific organizations represent still another important contribution to science. These activities include service as officers, directors, or committee chairmen of professional organizations, the planning of symposia or the presentation of papers at regional, national, or international meetings, and participation on grant-awarding panels, visiting committees, and writing

teams. An increasingly important activity of our staff is participation on panels established by agencies of the Federal Government to evaluate proposals for research programs that come from scientists in all parts of the country.

The Museum serves science in another important way through its excellent libraries, which include one of the finest and most comprehensive natural history libraries in the world and the renowned Osborn Library of Vertebrate Paleontology, as well as the growing reference collection of the American Museum–Hayden Planetarium which specializes in astronomy, navigation, meteorology, astronautics, and geophysics. The Division of Photography is also an excellent and heavily used source of reference, with more than one million negatives of subjects treated in both color and black-and-white.

To find new knowledge and not communicate it to others is a disservice to the scientific community and, indeed, to all mankind. The scientific publications of the Museum are basic to the advancement of science. Through the Museum's *Bulletin, Novitates, Anthropological Papers, Contributions of the American Museum–Hayden Planetarium,* and *Curator,* the staff reports their findings to their colleagues. The Museum deposits its publications in the major libraries of the world and exchanges them for those of other museums and scientific societies. These additions to the scientific literature provide information that is essential not only to other workers but to students who must know the progress that is being made in their respective fields of study.

We have outlined here some of the lesser known, specialized programs by which the Museum serves the cause of scientific discovery. These pursuits are interwoven with the extensive public programs of interpretation for which the Museum is well known. It is through the interweaving of learning and teaching, the blending of discovery and interpretation, that the Museum makes its unique contribution to science. The founders of this Museum set the institution on a course that has resulted in distin-

guished and extensive contributions to science for nearly a century. The present Board of Trustees supports policies and programs that will result in even more significant contributions to science in the years ahead. On behalf of the staff, I wish to thank all those who help to make the work of the Museum in science and education an increasingly dynamic force in our society, and to restate our intention to keep the American Museum of Natural History one of the outstanding museums of science in the world.

REVIEW OF THE YEAR 1962–1963

Once again it is a pleasure to report on the distinctions and honors bestowed on our scientists by other organizations.

Dr. A. E. Parr, Senior Scientist, was appointed Chairman of the Committee on Natural History Museums, International Council of Museums. Dr. Harry L. Shapiro, Chairman and Curator of Physical Anthropology, Department of Anthropology, was elected President of the American Eugenics Society. Dr. Junius B. Bird, Curator of South American Archeology in the Department of Anthropology, served until May as President of the Society for American Archeology. Dr. James A. Ford, Curator of North American Archeology in the Department of Anthropology, became President of the Society for American Archeology in May, succeeding Dr. Bird. Dr. Joseph M. Chamberlain, Chairman and Astronomer, Department of Astronomy and the American Museum–Hayden Planetarium, continues to serve as Chairman of the Committee on Education in Astronomy in the American Astronomical Society. Dr. Franklyn M. Branley, Associate Astronomer, Department of Astronomy and the American Museum–Hayden Planetarium, served as Chairman of the Committee on Visiting Professors in the American Astronomical Society. Dr. Jerome G. Rozen, Jr., Chairman and Associate Curator, Department of Entomology, was elected Vice President of the New York Entomological Society. Dr. Norman D. Newell, Chairman and Curator, Department of Fossil Invertebrates, was invited to give the Case Memorial Lecture at the University of Michigan and the presidential address to the Paleontological Society. Dr. Libbie H. Hyman, Research Associate in the Department of Living Invertebrates, received the honorary degree of Doctor of Letters at Upsala College in East Orange, New Jersey, and was named an Honorary Vice President of the XVI International Zoological Congress. Dr. Brian H. Mason, Chairman and Curator, Department of Mineralogy, continued to serve as Chairman of the National Advisory

Committee of the Nininger Meteorite Collection. In addition he continued to serve as the American Representative of the Commission on Cosmic Mineralogy in the International Mineralogical Association. Dr. E. Thomas Gilliard, Curator, Department of Ornithology, is Vice President of the Explorers Club. Dr. Edwin H. Colbert, Chairman and Curator, Department of Vertebrate Paleontology, served as Chairman of the Hayden Medal Committee of the Academy of Natural Sciences of Philadelphia. Dr. Oliver was elected a Fellow of the Rochester Museum of Arts and Sciences and appointed to the Executive Committee of the International Council of Museums.

In addition to the above distinctions, many staff members were honored with appointments, too numerous to record here, within their professional organizations.

The following staff changes took place during the year:

Mr. Vincent D. Roth was appointed Resident Director of the Southwestern Research Station, effective October 1, 1962. Five appointments and promotions were approved to take effect July 1, 1963. Dr. Evelyn Shaw, Research Associate in the Department of Animal Behavior, was appointed Associate Curator in that department. Dr. Robert L. Carneiro was promoted from Assistant Curator of South American Ethnology to Associate Curator of South American Ethnology in the Department of Anthropology. Dr. Franklyn M. Branley was promoted from Associate Astronomer to Astronomer in the Department of Astronomy and the American Museum–Hayden Planetarium. Dr. Kenneth L. Franklin was promoted from Associate Astronomer to Astronomer in the Department of Astronomy and

Two people with keen interest in the Hall of Eastern Woodlands Indians, now being prepared, examine a scale model that will be one of its exhibits. Dr. Stanley A. Freed, Assistant Curator of North American Ethnology, discusses the model with Miss Ramona Soto, a Klamath Indian from Klamath Falls, Oregon, who was chosen Miss American Indian this year. The exhibit shows Fox Indians preparing twine out of the bark of the basswood tree to be used for weaving bags.

Photograph: The American Museum of Natural History.

the American Museum–Hayden Planetarium. Dr. Wesley E. Lanyon was promoted from Assistant Curator to Associate Curator in the Department of Ornithology.

Two members of the staff who retired after many productive and devoted years of service to the Museum were Mr. Edwin C. Meyenberg, Bursar, who had been on the staff for 52 years, and Mr. Edward A. Burns, Manager of the Print Shop, who had been on the staff for 43 years.

We were saddened by the loss of two distinguished members of the scientific staff. Dr. Barnum Brown, Curator Emeritus in the Department of Vertebrate Paleontology, died on February 5, 1963, one week before he would have observed his ninetieth birthday. Mr. Charles K. Nichols, Research Associate and Honorary Librarian in the Department of Ornithology, died on August 26, 1962.

DEPARTMENT OF ANIMAL BEHAVIOR

Lester R. Aronson, Chairman

The research program of the department seeks an understanding of the fundamental processes of behavior in animals. We have come to realize that knowledge of the development of behavior in the individual, the organization of social behavior, and the biological and psychological mechanisms that underlie all behavioral activities are critical for our understanding of the nature of the animal and the human world. Thus studies of the characteristics of behavior and the causation of behavior are essential; from them we gain further insight into the processes of evolution and we learn how animals live successfully in their respective environments.

Several studies concerned with the development of social behavior are being carried out. The legionary ants that Dr. T. C. Schneirla has been studying for many years are quite remarkable for the intricacy of their social organization. Many thousands of individuals of varying ages and structure live to-

gether in a unit. They perform highly organized predatory raids, migrate regularly, and raise huge broods of young. In the past Dr. Schneirla has demonstrated how the basic reproductive processes of the queen, interacting with climatic and other environmental conditions, as well as the internal situations within the colony, form the basis for this complex and highly efficient ant society. This year, by comparing the behavior of species of legionary ants from different parts of the world, he has shown how the functional processes are modified under different conditions, climate, and environment to produce similar patterns of behavior in the species studied.

Dr. Evelyn Shaw's studies of schooling behavior in fishes are leading to important discoveries concerning the manner in which large numbers of individuals coordinate their activities so that they are able to live together harmoniously and to carry out their basic life functions effectively. Her investigations include studies of the attractive forces that bring the young fry together for the first time, and the sensory systems that the fish use to swim parallel to one another at constant distances. Among her important achievements this year was the development of a three-dimensional photographic method for the analysis of the continuing mechanics in the structure of the school. This aspect of her work was conducted at the Lerner Marine Laboratory with the cooperation of Dr. J. M. Cullen of Oxford University and Dr. Howard A. Baldwin, Director of the Laboratory for the Study of Sensory Systems in Tucson, Arizona.

Another study of the development of social behavior was carried out by Dr. Ethel Tobach. She is attempting to determine, through quantitative methods, the role of infantile experiences in the social interplay of adult rats. Since the accurate recording of the simultaneous behavior of several animals is extremely difficult, the use of a previously developed data-collecting system, called the ATSL, was employed. By this system, observations of behavioral activities are coded directly and fed into a computer for analysis. An earlier report on the

system has generated considerable interest. In December of 1962 Dr. Tobach organized a conference at the Museum, attended by many leading students of behavior, at which the ATSL system was explained and discussed.

Other members of the department continued to study the biological mechanisms of behavior. Dr. Helmut E. Adler is progressing on his analysis of the ways in which migrating birds find their way. Through a series of ingenious experiments, he and his associates have made a number of exact measurements of certain visual capacities of starlings and robins. Among these studies has been one to determine whether birds are capable of true celestial navigation by taking a "fix" on the sun, a constellation, or an individual star such as the North Star. Other investigations are aimed at measuring the accuracy of the sense of time in birds.

Mating behavior in male cats was the subject of further investigation by Dr. Aronson, Mrs. Madeline L. Cooper, and Miss Alba D. Plescia. Previously it had been thought that sensory stimulation affected mating behavior in general ways, by decreasing or increasing the level of sexual excitability. It is now known that specific sensory losses cause definite qualitative changes in the mating pattern. This study, which is part of a larger program for the investigation of the physiology and development of sex behavior, is important in showing that methods are available for our understanding of fundamental behavior patterns commonly called instincts.

The function of the forebrain in fishes was studied by Dr. Aronson and Mrs. Harriet Kaplan. African mouthbreeders were trained to discriminate between paddles with either a horizonal or a vertical stripe. When they pushed the correct paddle, the fish received a reward of food. Most of the fish could master this problem readily. They continued to do so after their forebrains had been completely removed, although the responses were much more erratic. Evidence from this experiment and similar ones indicates that the forebrain is an energizer of

neutral mechanisms situated in other parts of the brain.

Dr. William N. Tavolga is continuing his research on the sounds that fish make, the characteristics of under-water sounds that fish can hear, and the auditory apparatus of fish that enables them to hear these sounds. This year, in his work on sound production in fishes, Dr. Tavolga has found that the swim bladder of many sonic fishes operates on a highly efficient physical principle of a pulsating under-water air bubble. In collaboration with Dr. Jerome Wodinsky, he has established some basic facts about the sensitivity of fish to sound, specifically their thresholds of pitch and loudness.

Noteworthy among the departmental activities in the area of psychology are the lectures given by Dr. Schneirla at several universities and institutions for psychological research. His original theories on behavioral development are proving to be very useful to many investigators in their plans for future research.

Also, Dr. Margaret C. Tavolga has started a project concerned with testing the mental abilities of porpoises. Within the last few years much has been said and written that attributes extraordinary intelligence to these animals. The evidence in support of such conclusions is most indirect and tenuous and is not based on psychological experimentation. At the Lerner Marine Laboratory of the Museum, Dr. Tavolga is presenting porpoises with a series of psychological tests of varying difficulty. It is her hope that the results will assess realistically the mental level of these very interesting creatures.

This ambitious research program, of which only a few of the highlights are presented here, is helping to unravel some of the most difficult and intriguing problems concerning the minds of animals and has strong implications concerning the workings of the human mind. Through these various approaches and through the combination of many disciplines, such as psychology, biology, instrumentation, and computer mathematics, we are making significant strides toward our goals. The re-

search was aided in many respects by grants from the National Science Foundation, the National Institute of Mental Health, and the Office of Naval Research.

DEPARTMENT OF ANTHROPOLOGY

Harry L. Shapiro, Chairman

An observer studying the daily activities of the Department of Anthropology during the year would have been impressed by the variety of research projects, the range of exhibition programs, and the role played by the department in the cultural life of the community and the nation.

Instead of listing the highlights of the activities of the department during the year, this report presents examples to illustrate the scope of the research. On the one hand, under Dr. Margaret Mead, a cluster of problems is being investigated that has to do with the dynamics of culture, such as how the thinking of individuals is affected by their cultural conditioning, how communication is achieved or fails between different cultures, how behavior at specific stages of individual development is influenced. On the other hand, Dr. Junius B. Bird is bringing to completion the most detailed and intensive research on archeological textiles ever attempted. It will undoubtedly give a new dimension to textile research in general and new insights into Peruvian archeology in particular.

Dr. Shapiro's recent exploratory visit to the Belgian town of Geel, famous for its care of the mentally ill, and Dr. Gordon F. Ekholm's studies of the movement of cultural influences across the Pacific in prehistoric times provide other examples of the range and diversity of departmental research. A community study of Geel such as Dr. Shapiro proposes may well prove to be a fundamental contribution to a long-needed reform in our own procedures in the care of the mentally ill and mentally retarded. Dr. Ekholm's work has already been responsible for a distinct change in the reading of archeological evidence

that relates to the origins and development of pre-Columbian civilizations.

Similarly, one could cite Dr. James A. Ford's correlation of archeological sites with changes in river bed, and his investigations of the formative influences of Mexican culture on the people to the north; Dr. Robert L. Carneiro's analyses of cultural evolution and his studies of South American ethnology; Dr. Stanley A. Freed's study of a community in India; and Mr. Colin M. Turnbull's researches on Pygmies and his survey of primitive economies.

Enriching this galaxy in a significant way are the studies carried on by the various Research Associates, Fellows, and other scholars working in the department. Mrs. Antoinette K. Gordon's Tibetan studies are outstanding; Dr. Morton Levine is producing a pioneering book on primitive art; Dr. Dolly Menzel is concluding an analysis of a neglected epoch of Peruvian prehistory; Mr. Gerald Weiss is preparing a report on the Campa in Peru; and Mr. Thubten Jigme Norbu is writing, from his own experience as the abbot of a Tibetan monastery, a definitive monograph on the religion of Tibet as well as an anthropological study of Tibetan life.

The role the department plays in the community at large takes many forms. Both popular and professional lectures are a continuing activity of all staff members. Some also give courses on their subjects in universities in this area. Nearly every staff member contributes not only to Museum-sponsored programs but to many other radio and television programs as well. All are members of various scientific committees and scientific and lay boards. Most hold office in scientific societies as well as in other public organizations. Many render very specialized services, such as Dr. Shapiro's work as consultant for the various adoption agencies of New York City. The department also plays host to numerous student volunteers who receive some training in various aspects of anthropology and in museum experience.

These are very specific services, the impact of which can be traced and measured. There are many other diversified efforts, the significance of which cannot be readily assessed. It is difficult to measure the value of the dozens of answers we give daily to newspapers and magazines, to young students working on science projects, to high school and college students planning their careers. It is also difficult to weigh the effect of personal contact by the staff with the stream of visitors, collectors, amateurs, and professionals who flow through the department without cease. It is difficult to gauge the impact of the numerous popular articles and public appearances of the staff.

One may wonder how the staff can accomplish so much in the time available. The answer, of course, is that some of the above activities are performed after hours. Nevertheless these activities represent an extension of the department's work and augment the contribution of the Museum to the intellectual life of the nation.

DEPARTMENT OF ASTRONOMY AND THE AMERICAN MUSEUM–HAYDEN PLANETARIUM

Joseph Miles Chamberlain, Chairman

Attendance at the sky presentations of the American Museum–Hayden Planetarium, and enrollment in its course program, reflected a new phase in the development of public interest in the Space Age.

In the year after the launching of the first space satellites, planetariums around the world experienced record popularity. Lecture demonstrations on astronomy and celestial mechanics (the science that treats of the motions of objects in space) suddenly became urgent and exciting. Many people, concerned with their inability to understand some of the concepts that relate to the new scientific developments, enrolled in courses and lecture series.

Partly as a result of the interest awakened by these satellites,

the Planetarium attendance reached 609,000 in 1957 and 618,-000 in 1958—an all-time peak. But during the following four years the total number decreased slightly.

Now, in the fiscal year ending June 30, 1963, attendance has exceeded by 7000 the previous maximum of 618,000. It appears that the hasty response to the first dramatic events of the Space Age has been replaced by a long-term, determined, and more significant interest in astronomy and space science.

The popular presentations in the Sky Theater, supervised by Dr. Thomas D. Nicholson, continued to emphasize both the fundamental principles of astronomy and current developments in space exploration. More than 150,000 school children attended morning performances of these presentations as part of their school work.

The Planetarium course program also reflected the deeper and more permanent interests of the students. More teachers, more engineers, and more professional people in general took courses. While the introductory courses continued to be well attended, the advanced series of lectures attracted a larger proportion of the total enrollment than ever before.

The National Science Foundation provided financial support for the fourth successive year for two institutes: Astronomy and Space Science, for high school students of exceptional ability; and Astronomy in the Space Age, for teachers and supervisors of the elementary grades.

The several research projects under the supervision of Dr. Kenneth L. Franklin have been continued and expanded: the monitoring of radio radiation from Jupiter with a radio interferometer installed at the Kalbfleisch Field Research Station, the statistical analysis of radial velocities of selected stars as compared to similar data for radio hydrogen, and a seeing survey of the skies at the Southwestern Research Station preliminary to the possible erection of an observatory at that site.

Both Dr. Nicholson and Dr. Chamberlain completed dissertations relating to their Planetarium work, simultaneously fulfill-

ing the final requirements for the awarding of doctoral degrees.

The department assumed an active role in cooperating with the newly formed Natural History Press. Dr. Franklyn M. Branley accepted appointment as Chairman of the Editorial Advisory Board, and Dr. Nicholson agreed to serve as editor of a new *Astronomy Highlights* series, for which six members of the department have submitted manuscripts. The series is one of the first activities of the new publishing facility for the Museum and will be continued with several new publications each year, all based partly on Planetarium lectures.

Temporary exhibits installed during the year included a display of three working models of astronomical instruments (an orrery, a telescope, and a sextant) donated by the International Business Machines Corporation, and a group of original color paintings on lunar exploration lent by the National Geographic Society for a case exhibit.

DEPARTMENT OF ENTOMOLOGY

Jerome G. Rozen, Jr., Chairman

An important event for the department during the year was the arrival of Dr. Pedro W. Wygodzinsky. For the first time in a number of years the department has an active, four-man curatorial staff. The Museum is fortunate in having Dr. Wygodzinsky on the staff because of his unusually broad background. He is a world authority on the ancient insect order Thysanura and on certain groups of bugs of the order Hemiptera, and he has a well-established reputation for his work on flies. His primary interests are in the fields of systematics and zoogeography, in which he has published more than 180 papers in four languages.

Members of the department have been active in the three major areas of exhibition, curating, and research. In cooperation with representatives of other departments, the staff worked on plans for the Hall of the Biology of Invertebrates. This hall will present an interesting and thorough treatment of the ecology,

behavior, physiology, anatomy, classification, phylogeny, and evolution of the invertebrates, which comprise 94 per cent of the fauna of the world.

In the area of research much has been accomplished. After completing a 500-page manuscript on the moth genera *Melanolophia, Pherotesia,* and *Melanotesia,* Dr. Frederick H. Rindge began a series of systematic studies on a complex of genera related to *Melanolophia.* One of these studies, on *Vinemina,* has already been completed, and a second one has been started. Dr. Rindge also published a short paper on the moth genus *Eupithecia.* This manuscript summarizes much of the distributional data from specimens collected during Dr. Rindge's field trips of the past three years. Dr. Rindge has also begun a taxonomic-faunistic study of the geometrid moths of Baja California.

Most of Dr. Willis J. Gertsch's research time was devoted to the study of various groups of cave spiders. Of special note is the finding of a new species of the genus *Hypochilus* at the bottom of the Black Canyon of the Gunnison River, Colorado. This species, the second for the state, provides new distributional information for this relict genus. Also of interest is the fact that Dr. Gertsch now believes that there is an important fauna of obligative cave spiders of the family Agelenidae in various cave systems in Texas. Five species of blind spiders of the genus *Cicurina* have already been taken from the Austin region, and the discovery of others is expected. Dr. Gertsch's papers on the systematics of the spider genera *Ummidia* and *Zygiella* are nearing completion, and manuscripts on other spider groups, which Dr. Gertsch is writing with Dr. A. F. Archer and Dr. Martin H. Muma, are well advanced.

Dr. Rozen's research efforts were again primarily devoted to the study of the parasitic bee genus *Oreopasites.* Considerable progress was made on learning that isolating mechanisms operate in keeping separate two new species that live near the Southwestern Research Station. Dr. Rozen was also concerned with the interrelationships of numerous tribes of parasitic bees

in the family Anthophoridae and the relationships of these parasitic bees with the non-parasitic members of the same family. In an effort to achieve better understanding of these problems, Dr. Rozen has collected biological information on several parasitic tribes and has studied the first- and last-stage larvae of these groups.

In the field of paleoentomology, Dr. Rozen contributed a short paper treating the first-stage larva of the beetle *Micromalthus debilis* in Oligocene amber from Mexico. This species, the sole representative of the monotypic family Micromalthidae, has not heretofore been reported as a fossil. Though in some respects the extant form is considered a very primitive beetle, it has one of the most complicated life histories of any animal.

Dr. Wygodzinsky has nearly completed his revision of the bugs of the subfamily Emesinae. The manuscript presently amounts to more than 1000 pages Dr. Wygodzinsky also continued work with Dr. Robert L. Usinger on a synopsis of the blood-sucking bugs of the genus *Reduvius* of North America. Another paper, written in collaboration with Dr. Usinger and Dr. Ray Ryckman, on the biosystematics of the New World Triatominae (kissing bugs) is in the final stages of preparation. Work has been started with Dr. Sixto Coscaron on a peculiar group of blackflies of the genus *Simulium* that is represented in the Andean and Patagonian regions of Argentina.

A total of 147,669 specimens were added to the collection of insects and spiders this year, an increase that is nearly twice as large as the total accessions last year. While most of the material came from the United States, an important addition was Dr. Wygodzinsky's collection of the bugs of the family Reduviidae. This collection consists of more than 5500 specimens, including 39 holotypes and allotypes. Other important additions from outside the United States were 3000 butterflies from Tabasco, Mexico; 1443 geometrid moths from Oaxaca, Mexico; and 1827 butterflies from the island of New Britain in the Bismarck Archipelago.

In addition to its normal responsibilities, the department administered the Southwestern Research Station for three months, until the arrival of the new Resident Director.

DEPARTMENT OF FOSSIL INVERTEBRATES

Norman D. Newell, Chairman

The diverse activities of this department continued to cover many disciplines (historical geology, organic evolution, systematic geology, ecology, and zoogeography), with particular emphasis on invertebrates, the organisms that comprise more than nine-tenths of all animal life. Significant progress was achieved in programs of research, exhibition, and graduate teaching in these fields.

Dr. Roger L. Batten, a leading teacher and authority on historical geology and fossil invertebrates, was appointed to the staff on July 1, 1962, and has joined Dr. Newell in a broad program of investigation of the lower mollusks (gastropods and bivalves) of the Mississippian, Pennsylvanian, and Permian systems. During the year both Dr. Newell and Dr. Batten devoted considerable time to field work in the Southwest where they made two outstanding collections for use in this research.

Dr. Newell continued work on the revision of genera of fossil and living bivalve mollusks to be included in the encyclopedic "Treatise on Invertebrate Paleontology," a work that is appearing serially and involving the collaboration of more than 100 experts in many countries. He also pursued studies of Quaternary changes in sea level, the geological history of the Bahama Islands, and the causes of animal extinctions in the past. His recent work in the Bahamas has shed much light on the later geological history of these islands and on oscillations of sea level during the Pleistocene, matters that have important implications with respect to coral reefs in other parts of the world.

Dr. Batten, in addition to his collaborative work with Dr. Newell, was engaged in a monographic study and revision of

the upper Paleozoic gastropods of North America and western Europe. He also devoted time to contributions on gastropods for the "Treatise on Invertebrate Paleontology."

Dr. A. L. McAlester of the teaching staff of Yale University was appointed a Research Associate in the department. His research and publications on the lower Paleozoic bivalves have been widely acclaimed. Two other Research Associates, Dr. John Imbrie and Dr. Robert M. Finks, distinguished themselves through their work, respectively, on digital computer systems and fossil sponges.

Under the American Museum-Columbia University joint program of graduate training in invertebrate paleontology, one doctoral dissertation project was completed in the department, and a second was well advanced. Several other advanced graduate students, while studying mainly at Columbia University, made broad use of the facilities and guidance of the department.

A considerable amount of the curators' time was devoted to answering unscheduled public inquiries by interview and telephone, and to the processing of written inquiries. This cut sharply into the time given to teaching, administration, and exhibition and committee work.

DEPARTMENT OF HERPETOLOGY

Charles M. Bogert, Chairman

The Department of Herpetology continues to emphasize research in two interdependent fields of biology: (1) systematics and (2) ecology. Many aspects of the systematics and ecology of amphibians and reptiles can be investigated satisfactorily in the laboratory. The value of such studies is greatly enhanced, however, when work in the laboratory is correlated with investigations in the field. Department activities during the past year illustrate the advantages of combining laboratory and field investigations.

In the summer months of 1961 and 1962 Mr. Bogert visited isolated cloud forests on mountain summits in the state of Oaxaca, Mexico, that were seldom visited in the days when collectors had to rely on primitive methods of travel, and reports the capture of an interesting new salamander in the intricate ecological complex of habitats of the highlands bordering the southern Mexican plateau.

New species are undoubtedly represented in the collections obtained in Oaxaca, but additional work in both field and laboratory will be required for the status of some populations to be ascertained. A remarkable snake given to Mr. Bogert by Mr. Boone Hallberg, a botanist, proved to differ from other snakes in so many respects that it was described as a new species of an undescribed genus. This snake displays a combination of characters that cast doubt on the validity of the characters currently used to distinguish subfamilies in the largest Neotropical family of snakes. Coincidentally Dr. William E. Duellman of the University of Kansas also obtained a specimen of the new snake. Consequently he and Mr. Bogert collaborated in preparing for publication the description of the new genus and species.

Dr. Richard G. Zweifel continued his investigations of the affinities and distributions of the lizards of the genus *Cnemidophorus,* the whiptailed lizards that are most abundant in the southwestern United States and Mexico. After completing field work at the Southwestern Research Station of the American Museum of Natural History in 1958 and 1960, he turned his attention to an evaluation of the variation in a species that seems to be comprised wholly of females. Thus far the results of the study indicate that the range of variation in scutellation and color pattern within the unisexual species is similar to that of bisexual species. Local populations of female lizards, nevertheless, are much less variable than comparable populations of species with both sexes. Because populations composed of one sex cannot interbreed, local forms may develop that differ considerably from their nearest neighbors. Under some conditions

two distinct forms of the females, obviously derived from the same species, occur in the same places in the same habitats.

Dr. Zweifel's study of Fowler's toad at the Kalbfleisch Field Research Station is continuing. This study, which is primarily ecological, was initiated by Dr. Zweifel in 1960 in an effort to ascertain the rate of reproduction, growth rate, movements, and longevity of the toads. He was also interested in learning what effects changing environmental conditions, including seasonal and annual variations in weather, might have on the toads. The study has advanced with the invaluable assistance of students enrolled in the Undergraduate Research Participation Program of the National Science Foundation. Students captured, marked, measured, and released toads, and thereafter recorded the place where each was recaptured. Some toads were recaptured and released as many as fifteen times in one season. Such records provide a fair index to the movements and growth of the individual, in effect, a "biography" of the toad. It is necessary to continue such work for prolonged periods, in areas where environments remain undisturbed, before significant results can be obtained. Fortunately, the facilities of the nearby Kalbfleisch Field Research Station are almost ideal for such investigations.

For several years Mr. Bogert and Dr. Zweifel have been recording and analyzing the mating calls of frogs, and they continued their investigations of this and other aspects of the reproductive behavior of frogs. Mr. Bogert recorded few frogs in Mexico, owing to the drought in the area where he was working, but Dr. Zweifel obtained tape-recordings of the calls of a number of species in Panama. Mrs. G. Stuart Keith did similar work in East Africa, where her husband was engaged in studies for the Department of Ornithology of the Museum. She captured large numbers of frogs, several of which were important additions to the species in the department's collection. She also recorded the mating calls of a large percentage of the species collected, and the information secured will greatly augment our meager knowledge of anuran vocalizations and their significance

in the mating behavior of African frogs. Mrs. Keith's work will provide a firm foundation for investigations of isolating mechanisms and the extent of the diversification in the frog fauna of Africa.

Members of the department also devoted a large part of their time to curatorial duties and to services to laymen and scientific colleagues. Included in the approximately 5500 herpetological specimens added to the collections during the year was a generous gift from the Department of Tropical Research of the New York Zoological Society of some 1600 specimens accumulated by the late Dr. William Beebe and his associates.

DEPARTMENT OF ICHTHYOLOGY

Charles M. Breder, Jr., Chairman

Several different events this year indicate the directions in which the researches of the Department of Ichthyology will move for some time to come. The first major expedition to be undertaken by the department in a number of years was eminently successful. While studies were continued in the areas of life history, ecology, physiology, and genetics, there was a considerable increase in the taxonomic pursuits of the staff. Finally, for the first time in a long period, every position in the department has been filled satisfactorily.

A long-term project on the reproductive characteristics of fishes was concluded with the completion by Dr. Breder and Dr. Donn E. Rosen of a 2000-page manuscript which is a compilation and critical review of the literature on this subject.

Field work in the continuing studies by Dr. Breder of Gulf Coast fishes moved to the winter and summer seasons, investigations in the spring and fall quarters having been undertaken the previous year. This research, which is supported by a National Science Foundation grant, is being done in association with the Cape Haze Marine Laboratory, the Director of which, Dr.

Eugenie Clark, supervised the collection of pigmentation data by students in the summer of 1962 when Dr. Breder was unable to be in the field.

Dr. Rosen, in collaboration with Dr. Klaus Kallman of the New York Zoological Society, undertook an extensive three-month expedition to Guatemala, British Honduras, and Mexico, and brought back much valuable material from localities in which there had been little or no previous collecting. Important discoveries were endemic faunas in an isolated river basin in Alta Verapaz, Guatemala, and in the sulphur waters of Las Grutas de Coconá, Chiapas, Mexico, as well as many areas where preliminary sampling revealed the presence of numerous undescribed forms. The expedition, which was made possible by a grant from Mr. James C. Greenway, Jr., traveled by foot, mule, horse, Jeep, and Cessna 180, the last of which was used to enter remote and otherwise inaccessible areas and to check the drainage patterns of all the rivers from which material was collected.

Studies on the population dynamics of the mosquito fish (*Gambusia*) were continued by Dr. Rosen at the Kalbfleisch Field Research Station. He also devoted attention to phylogenetic studies of the major groups of bony fishes and to his contribution, covering the killifishes, to the series of volumes on fishes of the western North Atlantic.

Dr. C. Lavett Smith, who was appointed to the department staff on July 1, 1962, brought with him a revision of the American groupers on which he made considerable progress during the year. In this connection he spent six weeks at the Lerner Marine Laboratory of the Museum to investigate various hermaphroditic species, the reproductive details of which are little known. Dr. Smith also described a new species of goby from a collection of fishes he had made in the Pacific.

Dr. Phyllis H. Cahn expanded her studies on physiological development while continuing collaboration with Dr. Evelyn Shaw on research in the schooling behavior of fishes. Using a

miniature water "tunnel," Dr. Cahn studied the lateral line system and the ecological aspects of it that are concerned with perception, especially in relation to the age at which fish are able to form schools. The field work for these studies, which relate also to Dr. Breder's Gulf Coast studies, was carried out in part at the Cape Haze Marine Laboratory.

A sonic tag for tracking large fishes was satisfactorily developed. This project was carried out by Mr. George A. Bass and Mr. Mark R. Rascovich and was aided in many ways by the Office of Naval Research through a contract with the department that was terminated at the end of the year.

Dr. Perihan Sadoglu was appointed a Research Associate of the department on October 1, 1962. Dr. Sadoglu, now at Brown University on a postdoctoral grant from the National Institutes of Health, is continuing her work on the genetics of cave fish which was started in our laboratories in 1954 with Dr. Breder.

DEPARTMENT OF LIVING INVERTEBRATES

William K. Emerson, Chairman

Studies by Dr. Emerson of the mollusks of the tropical eastern Pacific Ocean progressed satisfactorily during the year. These studies included the classification, in collaboration with Mr. William E. Old, Jr., Specialist in the department, of the gastropod mollusks collected by the Puritan-American Museum expedition to western Mexico. As a result of this joint investigation, three scientific papers were published, and a fourth manuscript was completed. Studies on the late Cenozoic invertebrates collected by Dr. Emerson last year in the Gulf of California were initiated in collaboration with Dr. Leo G. Hertlein of the California Academy of Sciences and Mr. Morris K. Jacobson of New York.

Dr. Dorothy E. Bliss continued her long-term studies of the neuroendocrine control of growth, locomotor activity, and

water uptake and retention in the land crab, *Gecarcinus lateralis*. In this work, which is supported by the National Science Foundation, Dr. Bliss is assisted by Mr. Morris Altman and Mr. Christopher Ray. During the past year, their efforts have centered on the development of reliable techniques for the isolation and bioassay of physiologically active substances. In addition, Dr. Bliss has completed for publication her studies of the pericardial sacs of crabs. These sacs are modified in terrestrial species to assist in the uptake and retention of water under conditions that normally would be expected to lead to dehydration of the animal. The Museum published the book "Tissue Respiration in Invertebrates" by Dr. Bliss and Dr. Dorothy M. Skinner of the New York University School of Medicine. This book brings together for the first time a tabulated compendium of all published studies on invertebrate tissue respiration that are known to the authors. In addition to the table of respiratory rates, the work includes a detailed analysis of the data and a discussion of the principles and hypotheses that are related to them.

Dr. Meredith L. Jones continued his program of research on the taxonomy, distribution, and ecology of the marine polychaetous annelids of the Gulf of Mexico and the Caribbean area. He completed a study of the genus *Magelona*, resulting in the description of four new species and a new subspecies, as well as the redescription of a previously known species. In addition, Dr. Jones brought together, for final statistical analyses and conclusions, data on the spatial distribution of semi-microscopic

The Museum encourages college science students to learn scientific methods, techniques, and theories firsthand in the laboratory and in the field. Through programs sponsored by the National Science Foundation, the students help Museum scientists either during the summer months or in after-school hours during the academic year. Here Stefanie Wang, a student at the University of Miami, studies a sea fan with Dr. Meredith L. Jones, Assistant Curator in the Department of Living Invertebrates. Photograph: Arline Strong.

benthonic animals from the waters off Point Richmond, California.

During the summer, Dr. Jones made extensive collections of invertebrates in the Gulf of Mexico from Port Aransas, Texas, to Veracruz, Mexico. Later in the year, he collected polychaetes and other invertebrates from 22 stations at Bimini, Bahamas.

Dr. Libbie H. Hyman continued her work on Volume 6, Mollusca, of her monumental treatise, "The Invertebrates," and her studies on the free-living flatworms resulted in the publication of two papers. Dr. Horace W. Stunkard advanced his program of investigations on the morphology, life cycles, taxonomy, and systematics of parasitic flatworms. Dr. H. E. Coomans continued his studies on the marine mollusks of the West Indies and devoted much time to the reorganization of the mollusk reference collection, a project that is supported by the National Science Foundation.

Nearly 100,000 specimens were catalogued during the year, an accomplishment made possible by the invaluable assistance of several volunteer workers. Among the 130 accessions, most noteworthy are the collections of crustaceans, including type specimens, received from the Department of Tropical Research of the New York Zoological Society and the Peabody Museum of Natural History of Yale University.

The year saw the virtual completion of new office and laboratory facilities for the department. These quarters provide Drs. Bliss and Jones with modern facilities that will serve to expedite greatly their respective research programs.

The department lost a good friend and patron with the death of Mrs. Rodney Procter in July, 1962. Through her generosity, the Beatrice S. Procter Fund for support of the mollusk reference collection received an added endowment from her estate.

DEPARTMENT OF MAMMALOGY

Richard G. Van Gelder, Chairman

A three-year program to collect South American mammals was launched by the Department of Mammalogy in December. The aim of the project is to collect mammals, and their medically important ectoparasites, in South America and to provide valuable information to epidemiologists and immunologists concerned with the ecology of human disease. Little has been known about many of the insects and the mammals of South America, and proper identification of the species involved is vital to an understanding of diseases caused by insect vectors. The study is being supported by a grant from the United States Army Medical Research and Development Command.

The first expedition, which lasted through the end of May and took place in Uruguay, was very successful. The collections made were surprisingly different from those customarily made in North America. While bats and rodents were not found in abundance, large numbers of carnivores, such as foxes and skunks, were collected. The expedition obtained most of the mammals previously recorded from Uruguay as well as some that had not been recorded before. As a result of the expedition, the American Museum of Natural History will have the largest and probably most representative collection of Uruguayan mammals extant.

Dr. Van Gelder, Dr. Karl F. Koopman, and Dr. Sydney Anderson alternated in leading the expedition, the members of which included an entomologist and several South American zoologists. The expedition party started from Montevideo, traveled to western Uruguay and thence to northern Uruguay, and finished by working the eastern and southern coasts.

Other phases of the work of the Department of Mammalogy were also related to Latin America. In the spring of 1962 Drs. Anderson and Koopman were in the field in Chihuahua, Mexico, conducting a part of Dr. Anderson's study of the mammals of

that state. The classification and distribution of pocket gophers were the objects of this phase of the study. Earlier in 1962, he had published the results of his studies on the white-sided jackrabbits and the tree squirrels of Mexico.

In the fall Dr. Van Gelder went to Europe to continue his research on the classification of skunks, of which he studied specimens in museums in London, Paris, Munich, and Frankfurt. In the summer he continued to supervise the long-term studies of small mammal populations that are being conducted at the Museum's Kalbfleisch Field Research Station.

Dr. Koopman, in addition to his Latin American investigations, continued his studies of the bats of the Congo and the Sudan, concentrating during the year on a re-evaluation of the species collected by the Congo Expedition of the American Museum of Natural History. He also published a paper on the reidentification of bats from Arizona.

Mr. George G. Goodwin, Curator Emeritus, continued his work on the mammals of Oaxaca, Mexico. This study was enlarged considerably by the acquisition of several thousand specimens collected in that state by Mr. Merlin D. Tuttle and Mr. Arden Tuttle in 1962. Mr. Goodwin published a study on the bat genus *Vampyressa* earlier in 1962, and during the period of this report he published papers on rodents from the island of Tobago and on a new bobcat from Oaxaca.

Mr. Hobart M. Van Deusen continued studying New Guinea mammals collected on the 1953, 1956, and 1959 Archbold expeditions, and began plans for another expedition to New Guinea in 1964.

Mr. Fernando D. de Avila-Pires, Research Associate, was in residence at the Museum on a John Simon Guggenheim Memorial Foundation fellowship in 1962. His investigations of South American mammals included the evaluation of types of Brazilian mammals that were collected by Maximilian zu Wied-Neuwied (some of the first specimens obtained by the American Museum), studies of North American zoological expeditions to

Brazil, and systematic studies of South American mice, squirrels, and marmosets.

Members of the Department of Mammalogy were engaged in work on several exhibition halls, including the North American Small Mammal Corridor, the Hall of Primates, and the Hall of Ocean Life.

Part of the lower jaw of a Tasmanian wolf (*Thylacinus*) was acquired by the Archbold expeditions as part of a collection of subfossil mammal bones from New Guinea, and thus became the first record of that animal from New Guinea. It was one of 3862 specimens acquired by the department during the year.

DEPARTMENT OF MICROPALEONTOLOGY

Brooks F. Ellis, Chairman

The department, which was 20 years old in 1962, this year underwent a number of significant transitions. The last of the annual grants was received from contributing oil companies. These companies, which had recognized the importance of the services the Department of Micropaleontology was to give, had been contributing grants toward support of the department since 1947. It had been agreed that the grants would cease when the department received enough income from other sources to support itself. Since the grants amounted to approximately $15,000 a year, their loss will seriously affect the budget of the department. It is expected, however, that the 20 per cent increase in annual dues for members (subscribers to the "Catalogue of Foraminifera" and the "Catalogue of Ostracoda") will cover a major portion of this loss. Most of the rest of the deficit will be made up by new subscriptions to the microfilm edition of the "Catalogue of Foraminifera" and the cumulative effect of the annual dues from these subscriptions. In spite of economies, a deficit is anticipated for the coming year or so, but before long the department will be on a sound financial basis once more.

There were significant improvements in the quality of the papers published in *Micropaleontology* during the year. There are now nearly 1200 subscribers, spread over virtually every country in the world. More than half of these reside in foreign lands, as do somewhat more than half of the authors. The income from subscriptions, the sale of back numbers, reprints, and plate subsidy now amounts to more than the costs of printing and the salary of a full-time associate editor. It is of interest to recall that when the magazine was founded ten years ago many paleontologists warned that there would not be enough articles or subscribers to insure a successful operation. Now, however, the magazine has a backlog of excellent articles, and three new journals dealing with micropaleontology, founded in other countries since 1955, have reported the same situation.

Work on the "Catalogue of Foraminifera" and the "Catalogue of Ostracoda" progressed in a satisfactory manner during the year. One Russian supplement to the "Catalogue of Foraminifera" has been issued; the production of a second is under way. The financial aid that the department had hoped to receive from the National Science Foundation to assist in this project did not materialize, and the work is being carried forward at the expense of the department. While this is currently a serious financial burden, it is anticipated that the project will be worth while in terms of prestige and future financial returns.

The "Catalogue of Index Foraminifera," a four-volume reference work, is nearly completed, and plans are being made for publication. Some 1800 plates and 800 pages have been assembled, and the remainder will be compiled before the end of 1964.

Work on the biology of living foraminifera has gone forward steadily, and a new study of planktonic foraminifera has been projected for the coming year. A grant was received from the National Science Foundation to underwrite this program.

The Soviet-American Symposium that had been planned for

next year has not been developed because the Soviet scientists have encountered difficulties in making arrangements.

DEPARTMENT OF MINERALOGY

Brian H. Mason, Chairman

The activities of the Department of Mineralogy were largely concentrated on meteorites, including the chemical analysis and description, by Dr. Mason and Dr. H. B. Wiik, of specimens in our excellent meteorite collection. This research, which was financed in part by the National Science Foundation, resulted in the completion of seven descriptions for publication and numerous other scientific papers. In addition, Dr. Mason published a book on meteorites, the first on this topic to appear in English in some years.

Significantly, the meteorite collection at the Museum has been built up slowly and carefully over many years in which little attention was given to meteorites except by a small circle of mineralogists and astronomers. Since the opening of the Space Age, there has been a tremendous upsurge of interest from many scientific disciplines in these objects which are the only tangible material of extraterrestrial origin on our planet. As a result, the department has been increasingly called upon to supply information and advice, as well as meteorite material for study, to scientists and others in this country and abroad. In this connection, Dr. Mason is serving as a consultant to the National Aeronautics and Space Administration.

The department has supplied much of the material used in recent investigations that bear on the possibility of life in outer space. But whether the complex organic compounds in certain meteorites are of biological origin or not remains controversial, as does the question of some "organized elements" found in these meteories.

During the past few years requests for meteorite material

to be used in research have been consuming the meteorite collection at a greater rate than new material is being acquired. In an attempt to correct this situation, Dr. Mason began a four-month expedition in May, 1963, to collect meteorites in Australia. The expedition is supported by a grant from the National Geographic Society. In the summer of 1962, Dr. Mason studied several meteorite collections in Europe and participated in a conference on the analysis of meteorites at the British Museum (Natural History).

Outstanding among the approximately 500 specimens of minerals and gems acquired by the department during the year was the gift of a large, faceted, morganite beryl of 255 carats from Mr. and Mrs. Frank Ix of Charlottesville, Virginia. An exceptionally fine, 542-carat, emerald-cut kunzite from Brazil was purchased with income from the Florence Perkins Fund; and three beautifully carved animals (an agate turtle, a jade alligator, and an obsidian buffalo) were purchased with income from the William Boyce Thompson Fund.

Considerable thought and time were devoted to the planning of a new hall of physical geology and the complete reorganization of the displays of minerals, meteorites, and gemstones.

Routine curatorial activities included the identification of some 4000 specimens of minerals and rocks for the public.

DEPARTMENT OF ORNITHOLOGY

Dean Amadon, Chairman

Studies of birds from various parts of the world were conducted by the department, and there was especially intensive activity in the areas of field work and publishing. Dr. Amadon's two-volume work on the birds of prey of the world, written with Mr. L. H. Brown, was completed during the year. He also conducted field work and studies of the birds of Australia as staff representative on the Great Barrier Reef Expedition, sponsored by the Museum. One result of the trip is a study of how the fa-

miliar "budgie" (parakeet), a native of Australia, is adapted for life in the deserts of that continent. Another research project conducted by him dealt with birds in Argentina.

Dr. E. Thomas Gilliard continued his work on specialized arena display in birds. His paper on the courtship of the cock-of-the-rock was published, and a handbook on the birds of New Guinea and various research papers on the birds of New Guinea and New Britain were brought near to completion.

Dr. Charles Vaurie investigated the birds of Eurasia in European museums, in a study sponsored by the Frank M. Chapman Memorial Fund. The manuscript for the second and final volume of his "The Birds of the Palearctic Fauna" was completed.

Dr. Wesley E. Lanyon continued his studies of the flycatchers (genus *Myiarchus*) of the West Indies, using experimental methods that included taking tape-recordings of the calls. In addition he conducted research on local birds at the Kalbfleisch Field Research Station.

Other members of the staff, including those who have retired from active work or hold honorary appointments, were active in scientific research and conservation.

Mr. Eugene Eisenmann, who has been conducting research on tropical American birds, published a number of papers during the year. Mr. Crawford H. Greenewalt undertook experimental studies of the biophysics of bird song and also investigated the remarkable hummingbird *Loddigesia* in South America. Mr. and Mrs. G. Stuart Keith conducted field work in East Africa in the interests of the Department of Ornithology and the Department of Herpetology. Dr. Robert Cushman Murphy, sponsored by the National Science Foundation, attended an international conference on Antarctica in Paris. His article in *Science* on conservation in Antarctica was selected by the United States Information Agency for translation and distribution throughout the world.

The Frank M. Chapman Memorial Fund contributed to the

support of numerous ornithological projects in all parts of the world.

The Hall of North American Birds was brought nearly to completion, and several of the habitat groups in the Hall of Birds of the World were renovated and greatly improved.

Attempts were made to acquire rare forms lacking in the collection and to fill out the gaps at the species level in the study collection. Among the rarities that were received by exchange with the British Museum (Natural History), the United States National Museum of the Smithsonian Institution, and the Museum of Southern Rhodesia was a specimen of the rare Teita falcon. The department now has every one of the more than 300 known species of diurnal birds of prey available for study and comparison. Considerable time and effort were spent in rearranging the collection in order to render it more useful.

In addition to the regular staff of the department a number of scientists were, in effect, temporary members of the staff during the year. Their work was supported by the Frank M. Chapman Memorial Fund, the National Science Foundation, and the Solomon R. Guggenheim Foundation. Dr. Douglas A. Lancaster is conducting a two-year study of the tinamous (Tinamidae), with field work in Argentina. Dr. Alexander F. Skutch is carrying out field studies of birds in Costa Rica. Dr. Leslie L. Short, Jr., is studying speciation in woodpeckers, with field work in Arizona and Mexico. Dr. William G. George studied bird classification, with field work in Peru. Dr. Paul Slud conducted evolutionary studies of the fauna of Cocos Island.

We regret to note the death of Mr. Charles K. Nichols, Research Associate and Honorary Librarian of the department,

The beauties of the Australian Barrier Reef are brought close to reality for visitors in the Whitney Memorial Hall of South Pacific Birds. The popular evening courses for adults often make use of these magnificent exhibits. A class in drawing and painting from nature planned for this fall will hold sessions in the Whitney Hall. Photograph: Arline Strong.

in 1962. A portion of his fine library came to the Museum as a gift from his children.

DEPARTMENT OF VERTEBRATE PALEONTOLOGY

Edwin H. Colbert, Chairman

Any annual report on scientific research, because of the nature of the research, is necessarily devoted in part to an account of projects that are held over from a preceding year and that continue on into the following year. Worth-while projects take time, and it is well to be reminded of this fact by noting their continuing progress in successive reports.

Each of the three curators in the department is engaged in long-range projects. Dr. Colbert is concerned particularly with Triassic reptiles and the faunas in which they are contained. Dr. Bobb Schaeffer has for many years been working on the evolution of Triassic fishes and on Mesozoic fish faunas in general, as well as on the problem of primary diversification of the bony fishes. Dr. Malcolm C. McKenna is studying very primitive mammals, especially those that lived at the end of Cretaceous times and during the early phases of the Tertiary.

During 1962 Dr. Colbert made an extensive trip to Israel, South Africa, and central Europe, under a National Science Foundation grant for the study of Triassic faunas throughout the world, with particular emphasis on the faunas of the Southern Hemisphere. This problem is closely related to the evolution of reptiles during the early phases of Mesozoic history and, of course, to the problems of continental relationships and climates of that time. Dr. Colbert's trip was highly productive in many ways. He first spent some time with Prof. Georg Haas and his associates at the Hebrew University in Jerusalem. Field studies were made in the Makhtesh Ramon in the Negev, with emphasis on the Triassic sediments from which Dr. Haas has been collecting some very interesting reptiles. Later, in Africa, Dr. Colbert worked in the famous Karroo deposits of the Karroo

Basin and in the upper Triassic sediments of Basutoland and vicinity. He also made two trips to Newcastle, England, the first to attend the Tenth Annual Symposium on Comparative Anatomy and Vertebrate Paleontology, and the second to participate in a symposium on paleoclimates, which was sponsored by NATO.

Dr. Schaeffer made a collecting trip to the Dockum Formation in Texas during the year. His long-range project on the Mesozoic fish faunas of the world has resulted in the accumulation of data on more than a thousand localities, including faunal lists and pertinent information on stratigraphy, paleogeography, and paleoecology. The compilations for the Triassic and Jurassic faunas have been brought up to date, and substantial progress has been made on the Cretaceous faunas. Mr. Gilbert F. Stucker collected Triassic fishes in the high Rockies of British Columbia, in collaboration with paleontologists of the National Museum of Canada.

In the field of mammalian paleontology, a major research problem for Dr. McKenna was a study of the comparative cranial anatomy and the classification of the fossil and recent insectivores and their allies. Dr. McKenna carried on a field program in the early Tertiary Huerfano beds of Colorado, and worked in other Tertiary sediments as well.

Dr. Schaeffer devoted attention to an exhibit on the history, paleoecology, and life of the Eocene lakes in Wyoming, Utah, and Colorado, for the Hall of Early Mammals. Dr. McKenna also worked on that hall, for which he supervised construction of the exhibit on the archaic mammals, designed the exhibit on archaic carnivores, and supervised the preparation of specimens that are to be used in these exhibits.

As in the past, the three curators in this department have continued their work as members of the staff of Columbia University. At the present time there is an unusual number of graduate students in the department, who are doing advanced work toward the doctoral degree, and it is evident that there

will be even more in future years. Although the number of students we have strains our resources, their presence is a tribute to the American Museum as a world center for training in fossil vertebrates.

Curatorial activities have kept members of the department busy. Continuing a project started last year, the technicians devoted one day per week to a rehabilitation of the fossil reptile collections. This has been a protracted task, but we are satisfied that the hours devoted to it have been well spent. The work has involved the cleaning and treatment of thousands of reptilian bones, dominated by the huge bones of dinosaurs. In addition, much curatorial work was devoted to fossil mammals, which involved the cataloguing of hundreds of mammalian specimens collected in late Cretaceous and early Tertiary sediments. Curatorial work on the Patten fish collection, obtained from Dartmouth College, was begun during the year.

The departmental personnel was augmented by the employment of Miss Charlotte P. Holton, to occupy the position formerly held by Miss Jeanne Lyons. Miss Holton is particularly concerned with the cataloguing of specimens and the supervision of the Osborn Library.

The death of Dr. Barnum Brown on February 5, 1963, marked the end of an era in the department. Dr. Brown came to the Museum in 1897 in the days when the department was young and in the process of formation under the supervision of Henry Fairfield Osborn. He had a long and illustrious career and was particularly noted for his collections of fossil reptiles, especially dinosaurs. It can truthfully be said that our Hall of Late Dinosaurs, often called the Tyrannosaur Hall, is a monument to Dr. Brown's work in the field.

SPECIAL ACTIVITIES

ARCHBOLD BIOLOGICAL STATION

LAKE PLACID, FLORIDA

Richard Archbold, Resident Director

The station continued to serve as a center to which scientists from various places in the country journey in order to carry out highly specialized scientific projects. Among these projects were the following:

Dr. David George Kissinger, Atlantic Union College, collected weevils of the genus *Apion* to determine host plants and to collect larvae. Dr. Karl V. Krombein of the United States National Museum, Smithsonian Institution, studied the behavior and life history of wasps that can be induced to nest in borings in sticks of wood. Another part of his project dealt with a study of the biology of some of the ground-nesting wasps found on sandy flats in the Lake Annie area just north of the station.

Dr. Lawrence R. Penner of the University of Connecticut conducted parasitological investigations for the sixth successive summer. These include the investigation of the biological aspects of avian schistomiasis in southern Florida, and involve the marking of parasitized and non-parasitized mollusks and studies on their growth, as well as the relationships of their definitive as well as intermediate hosts. Dr. Penner undertook a number of other related investigations.

Dr. Frank E. Kurczewski of Cornell University studied eight species of the digger wasp *Tachysphex*, which occurs in central and southern Florida, in order to determine the significant relationships between species of this genus.

Dr. Stuart W. Frost, Professor Emeritus at Pennsylvania State University, continued his light-trapping of nocturnal insects for the fifth consecutive season.

Dr. Leonard J. Brass has begun a revision of identifications in the Archbold station herbarium. Much of the collection was made, and identified as far as possible, in 1945. With the advantage of publications that have appeared during the past few

years, and greater experience with the flora, an attempt is now being made to complete the naming and bring it up to date.

Mr. Archbold collaborated in the field work of Dr. Krombein, which is mentioned above, and participated in a number of other studies being carried out at the station.

KALBFLEISCH FIELD RESEARCH STATION
HUNTINGTON, LONG ISLAND, NEW YORK

Wesley E. Lanyon, Resident Director

Seven departments of the Museum used the station during the year. Dr. Richard G. Zweifel of the Department of Herpetology completed his three-year study of the distribution, dispersal, and growth rates of Fowler's toad. Dr. Donn E. Rosen of the Department of Ichthyology continued his study of the populational genetics of an introduced population of mosquito fish, and introduced another species, the spinetail platyfish, for similar study.

Dr. Richard G. Van Gelder of the Department of Mammalogy and Dr. Lanyon continued their long-range studies of the succession of small mammal populations and breeding bird populations, respectively. Four species of birds were added to the station's list, bringing the total of birds recorded to 133, and the total number of vertebrate species to 173. The bird-banding program at the station has disclosed valuable data, and more than 8000 individual birds of 102 species have now been banded.

Outstanding additions to the aviaries at the station were five young meadowlarks taken from a nest near Poughkeepsie, New York, along with their parents, a female eastern meadowlark and a male western meadowlark. Hybrid meadowlarks of known parentage are extremely rare, and Dr. Lanyon is pleased to have the opportunity to study their behavior and breed them. It is hoped that the parent birds will breed again, this time in the aviaries at the Kalbfleisch station.

Dr. Jerome G. Rozen, Jr., of the Department of Entomology tested an insect trap of new design at the station. It was so suc-

cessful that others were constructed for use at the Southwestern Research Station and on the expedition of the Department of Mammalogy in Uruguay.

Dr. Kenneth L. Franklin of the Department of Astronomy made progress in his study of the radiation emanating from the planet Jupiter and began using new equipment to improve reception of this low-energy radiation. Dr. Jack McCormick, Consultant in Ecology at the station, continued his long-term studies of the succession of the vegetation and his documentation of the local flora. A new vegetation cover map is being prepared, based on a complete set of stereo pairs of aerial photographs taken in the summer of 1962.

Seven college students were in residence in 1962, and eight were in residence in 1963, as members of the Undergraduate Research Participation Program sponsored by the National Science Foundation. In addition, one student received an award from the Frank M. Chapman Memorial Fund to do research in ornithology at the station during the summers of 1962 and 1963.

Mr. William Hutchins completed his first year as superintendent at the station, and under his direction a number of renovations and improvements were made.

LERNER MARINE LABORATORY

BIMINI, BAHAMAS

Robert F. Mathewson, Resident Director

More than 350 scientific investigators from research institutions, including museums, universities, hospitals, and government agencies, conducted field work at the Lerner Marine Laboratory for periods varying from a few days to several months. Of particular interest among their projects were histochemical studies of fish muscle and its relation to muscular dystrophy; investigations of inhibitors of animal viruses, particularly those that may be active in inhibiting cancer; regeneration experiments with certain primitive flatworms; geological studies involving carbonate sedimentation, reef formation, and

the paleoecology of the Bahama Bank; and various behavioral studies of fishes, porpoises, and the green turtle.

The First International Conference on Marine Bio-Acoustics, held at the laboratory in April, brought together some 85 scientists in various disciplines to exchange information on their work in this fast-developing branch of research. Other groups meeting at the laboratory during the year included the National Science Foundation Panel on Developmental Biology; the Shark Research Panel of the American Institute of Biological Sciences; and the National Cancer Institute of the National Institutes of Health.

A unique under-water acoustic-video system developed by the Institute of Marine Science of the University of Miami, under the sponsorship of the Office of Naval Research, was established at the laboratory and formally dedicated in September. This shore-based installation, consisting of under-water listening devices in conjunction with under-water television, is providing valuable information on the occurrence and identification of marine sound producers.

During the year Mr. Mathewson collaborated on two continuing projects at the laboratory: one on the metabolic functional interrelation of fish supramedullary neurones, with Dr. Gerard M. Lehrer, Director of the Laboratory of Neurochemistry, Mt. Sinai Hospital, New York; the other on the electrophysiology of elasmobranch sensory systems, with Dr. Edward S. Hodgson of Columbia University and Dr. Perry Gilbert of Cornell University.

A long-range survey to determine the ecology and marine populations in the waters of the Bahamas was initiated by the laboratory, with support from the Biology Branch of the Office of Naval Research which provided a 65-foot motor vessel for use in the survey. Other long-range studies based on the laboratory were commenced under the aegis of the National Cancer Institute, the National Science Foundation, and the Atomic Energy Commission.

Because of the increase in the requests for the use of the laboratory by scientists in this country and abroad, consideration is being given to expansion of the present facilities to a point commensurate with the demands for studies on the variety of marine organisms available in Bahamian waters.

SOUTHWESTERN RESEARCH STATION

PORTAL, ARIZONA

Vincent D. Roth, Resident Director

Mr. Vincent D. Roth was appointed Resident Director on October 1. A specialist in spiders, Mr. Roth had worked with Dr. Willis J. Gertsch, Department of Entomology, on a number of research projects. He came to the station from the University of California Agricultural Extension Service in El Centro, where he was Assistant Agriculturist and entomological farm advisor for Imperial County, one of the most important agricultural counties in the country.

During the year 49 scientists and fifteen students or assistants were in residence at the station. Among these were eleven entomologists, nine ornithologists, and 29 scientists representing fifteen other fields. Ten papers published during the year by former visitors presented information obtained at the station. In addition 55 students visited the station in class groups.

Mr. Roth is engaged in a taxonomic revision of the spiders of the Agelenidae of South America and completed two manuscripts on spiders during the year. In addition, he gave a number of lectures on the Southwestern Research Station to various groups in Arizon and New Mexico.

The new Resident Director has started a program of refurbishing the facilities, and substantial improvements have already been made.

DEPARTMENT OF EDUCATION

John R. Saunders, Chairman

Four new activities were started by the department during the year and were carried on in addition to the regular department programs and services.

The Natural Science Center for Young People presented seven courses on Saturday mornings during the winter. In addition to the Center staff, Miss Alice Gray, Miss Marlyn Mangus, Mr. George Foley, and Mr. John Bull of the Departments of Entomology, Vertebrate Paleontology, Herpetology, and Ornithology, respectively, acted as instructors. The courses covered birds, rocks and minerals, and an introduction to the natural history of the New York region. The classes were given for children between the ages of eight and sixteen.

Treasure hunts for children and adult and family tours were activities carried on during the summer months. In the treasure hunts, children were given lists of questions and asked to find the answers by browsing through the Museum halls. Both the hunts and the tours were well received and will be presented again.

The fourth new activity of the year was a project in which exhibits were placed in the corridor exhibition cases in the main foyers of selected schools. The first such installation consisted of an ethnic exhibit of dolls representing several different cultures, placed in two large exhibition cases in the entrance foyer of Public School 129 in Manhattan. The exhibit was designed and installed by an instructor in this department. This exhibit, and similar ones, will be installed in other schools dur-

A treasure hunt through the halls of the American Museum of Natural History! This exciting prospect draws hundreds of boys and girls to the Museum on weekday afternoons during the summer. This young man, answering a question about the plant-eating dinosaur Styracosaurus, *digresses a moment for a study in comparative anatomy.*

Photograph: Arline Strong.

ing the coming year. Each exhibit will remain in a given school for at least one month so that all the children of the school and possibly of neighboring schools can have an opportunity to view it. This new service is offered, of course, in addition to the regular circulating exhibits that are distributed by the department for classroom use.

The success of the week-end Natural Science Bus Trip in the previous year led to the presentation of two more such projects during the current year. Both were oversubscribed. The Adult Education Division is planning a longer Natural Science Bus Trip for the coming year. This trip will last for twelve days and will cover many areas of natural science interest in the Northeast, including the Gaspé Peninsula.

During the year the department received a very fine teaching collection of contemporary ethnological material from Basutoland, Africa. This was gathered by Mrs. Margaret Colbert when she accompanied her husband, Dr. Edwin H. Colbert, Chairman of the Department of Vertebrate Paleontology, to Africa. The artifacts enriched the growing collection of teaching materials, which are used daily in "The World We Live In" program and for the special classes of children who are physically or emotionally handicapped.

In May the Avalon Foundation informed the Museum that an application made by the department for a grant had been approved. This grant will finance an expansion of the program of instruction for children confined to hospitals, and for children in special schools, for the next two years. For some years the department has provided this service only in the months of May and June, but for the next two years, at least, the program will be available throughout the school year.

In April Mrs. Miriam C. Stryker, Senior Instructor, left for a two-month visit to St. Lawrence Island off the coast of Alaska. While there she continued her study of the Eskimos at Savoonga and Gambell and photographed the daily activities of these people, including their annual walrus hunt. She also made tape-

recordings of Eskimo music. She will use the information and materials in her courses for teachers and in her work with school classes at the Museum. Her photographs will be added to the collection of the Division of Slides and Photography.

The department was again handicapped by long delays on the part of the municipal authorities in filling positions of museum instructors when vacancies occur. During the year the departmental teaching corps was never at full strength; there was an average shortage of two teachers. At present there are three vacancies. Despite these unfortunate handicaps, all the major programs of the department were continued during the year. The total student body served by all the teaching and lecturing programs was 236,109 individuals who received 423,736 hours of instruction in a total of 12,119 sessions in the classroom, laboratory, lecture room, and exhibition hall, as well as in conference and in the field.

All the educational services and programs of the Museum totaled 16,433,736 different contacts during the past year.

DEPARTMENT OF EXHIBITION AND GRAPHIC ARTS

Gordon R. Reekie, Chairman

Eight new or reconstructed halls and a number of temporary exhibitions and smaller exhibits occupied the Exhibition Division during the year. All but six displays have been finished in the Hall of North American Birds, which is scheduled to be opened next spring. The habitat groups completed during the year are those of the sandhill crane, American egret, Labrador duck, and coastal birds.

The habitat groups in the Hall of Birds of the World, which was installed in the 1920's, are undergoing renovations. The exhibits that have been cleaned and repaired are those of the upper Andes, Congo forest, east African plains, American tropical forest zone, and South American temperate zone.

Preparation of the exhibits for the new Hall of Eastern

Woodlands and Plains Indians is nearly two-thirds completed, and it is hoped that the hall will be ready for installation during 1964. About 40 per cent of the exhibits for the Hall of the Biology of Primates have been completed, and it is hoped that reconstruction of the hall will be completed by the end of 1963. The individual display panels for both the Indian and primate halls are being put in storage pending completion of the halls.

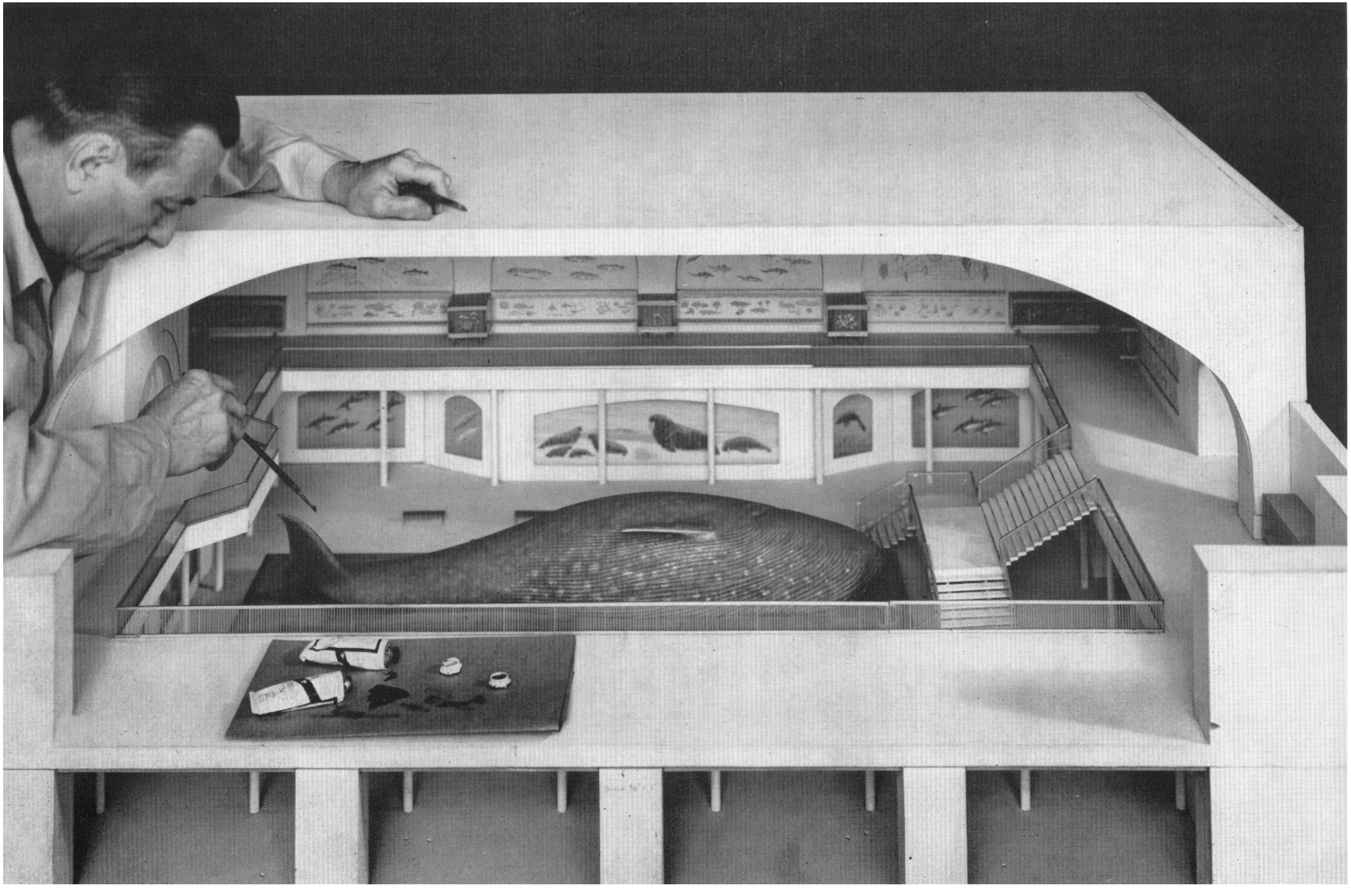
Work on both the design and preparation of exhibits for the Hall of the Biology of Invertebrates is progressing. Designs for the exhibits in the Hall of the Peoples of Africa are completed.

Administrative approval of the general design of the new Hall of the Peoples of the Pacific was given during the year, and work on the structural details of the complex display arrangements should start soon. One of the two miniature dioramas being prepared (the Australian aborigines' burial ceremony) was finished during the year, but no new exhibit preparation has yet begun.

Exhibits in the Corner Gallery are tending to become more complex and therefore to be kept on display for longer periods. For example, the exhibit "Dating the Past with Atoms," which opened in June, 1962, was not closed until May, 1963. On June 19, "Partners In Discovery," organized jointly by the Museum and the National Geographic Society, was opened in the gallery. This elaborate exhibition, which will continue until January, 1964, commemorates the seventy-fifth anniversary of the Society and the mutual interest of the two institutions in exploration.

Museum artist Ludwig G. Ferraglio works painstakingly on a scale model of the new Hall of Ocean Life, which is now under construction. Creation of a major hall at the Museum requires the combined efforts of scientists, designers, and technicians, and may take years from conception to completion. During the coming years the Museum will open halls with exhibits interpreting the biology of invertebrates, the biology of primates, African life, peoples of the Pacific, North American birds, ocean life, and Eastern Woodlands Indians.

Photograph: The American Museum of Natural History.



The exhibition "Man In Space" was revised in keeping with new activities in and plans for space exploration. A scale model of the Gemini Capsule aboard its Titan II rocket booster was added and a photograph of Astronaut L. Gordon Cooper was installed just after his historic flight.

Small displays in the Seventy-seventh Street Foyer included Maria Sybilla Merian's book, "Insects of Surinam," a different page of which was shown each day for several months; Abraham Lincoln's life mask and a cast of his hand; and garden sculpture, replicas of museum pieces, which are on sale in the Museum Shop.

In the spring the department was invited to install a temporary exhibit at Katzenbach and Warren, wallpaper design and manufacturing firm of New York. The display, called "Wallpaper is a Natural," presented Museum artifacts and specimens against a background of related handprinted wallpapers.

In October, 1962, Luther A. Williams, Chief of the Exhibition Division, resigned; he has not been replaced. Mr. Reekie has been devoting much more of his time to directing the work of that division while delegating increased responsibility to the three supervisors for day-to-day operational problems.

In April 1963, Mr. Edward A. Burns, Manager of the Print Shop, retired, and the division came under the supervision of this department.

The work of the Graphic Arts Division has greatly increased because of the establishment in 1962 of the Natural History Press. Responsibility for design and layout of the new magazine *Nature and Science;* provision of all art work for the *American Museum Science Books* series; and the design of much attendant promotional material has fallen to the division, which has employed two additional artists.

LIBRARY

George H. Goodwin, Jr., Librarian

The resources of the Library were used actively by the Museum staff and the general scientific community, as well as by colleges and universities, commercial organizations, and other museums. As many as 35,699 volumes were circulated, and 10,848 reference inquiries were answered. Attendance in the Library reached 10,822. There were 1187 requests for loans, an increase of more than 100 per cent over the figure of two years ago. Within the same period the Library borrowed only 65 volumes for use by Museum scientists.

There were 15,368 periodicals, 2135 books, and more than 200 new serial titles added to the collection as the result of both purchase and exchange agreements. The Library has continued to acquire out-of-print and rare items when possible and as the budget permits.

The Library has been fortunate in receiving funds from various sources to augment the regular budget. Mr. Cyril F. dos Passos continued as chairman of the advisory group of the Friends of the American Museum Library. This group was responsible for gifts to the Library for rare book restorations and acquisitions. Among the contributors were Mr. and Mrs. Robert D. Sterling and Mr. dos Passos.

Mrs. Nancy Russell, specialist in rare book restoration, continued her work on this invaluable part of the collection.

Among the future programs with high priority for which funds are needed are the acquisition of many out-of-print and scarce items in all areas of Museum interest; the installation of much-needed air conditioning; and the reclassification and recataloguing of the entire Library collection.

Mrs. Lothian E. Lynas was appointed to the staff in October, 1962, as Acquisitions Librarian, and Mr. Curtis W. Sabrosky was named an Associate in Bibliography.

PUBLICATIONS

SCIENTIFIC PUBLICATIONS

Ruth Tyler, Editor

The Department of Scientific Publications issued two *Anthropological Papers,* totaling 296 pages; seven *Bulletins,* 458 pages; and 43 *American Museum Novitates,* 980 pages. The special publication "Tissue Respiration in Invertebrates," by Dr. Dorothy E. Bliss and Dr. Dorothy M. Skinner, of 150 pages, brought the total number of printed pages to 1884.

As of May 15, 851 typewritten pages were in press, and 3583 typewritten pages in the editorial office awaited publication. Fewer pages were printed in 1962–1963 than in the previous year because of a reduction in appropriated funds.

CURATOR

Edwin H. Colbert, Editor-in-Chief

Curator continued to publish articles that were widely read and discussed by members of the museum profession in many parts of the world. The contents of recent issues dealt with such subjects as creativity in junior museums, the preparation of museum labels, and new techniques of exhibition, and treated such topical issues as the proposed legislation for New York State aid to museums.

NATURAL HISTORY PRESS

Franklyn M. Branley, Chairman, Editorial Board

The Natural History Press, a division of Doubleday & Company, Inc., was established in 1962 to serve as publishers to the Museum and thereby to extend the scientific and educational goals of the Museum to an ever-widening public.

Editorial headquarters of the Natural History Press are based at the Museum. Policies are guided by a scientific-editorial board composed of prominent scientists, educators, and editors

as well as appropriate members of the administrative staffs of the Museum and Doubleday.

The Natural History Press is planning publication both of periodicals and of several series of books in all areas of Museum interest and will include technical works, textbooks, children's books, adult trade books, and specially illustrated editions. The first series, *American Museum Science Books,* was scheduled for the fall with the publication of four titles. This series of short, well-illustrated, paperback books will include writings in the life and earth sciences, astronomy, and anthropology. The first hardcover book to be published by the Press, "Wasp Farm" by Howard Ensign Evans, was also scheduled for the fall.

In addition, fall publication was scheduled for a new periodical for children in the middle elementary grades. The magazine, called *Nature and Science,* will be published fortnightly during the school year, and each issue will carry a special teacher's edition.

NATURAL HISTORY

Robert E. Williamson, Managing Editor

Natural History magazine has continued to place emphasis on quality, on the basis of which promotion, circulation, and advertising have been increased. As a result, it has enjoyed the most successful financial year in its history.

An attempt has been made to interest top-ranking scientists in every field of the biological and earth sciences in writing for *Natural History.* This effort should be facilitated during the coming year through the formation of an Editorial Advisory Board, combining members of the former Editorial Consultants and Scientific Staff Advisers. The chairman of the new committee is Mr. Gerard Piel. Other members are Dr. Dean Amadon, Department of Ornithology; Dr. Gordon Ekholm, Department of Anthropology; Mr. Gordon R. Reekie, Department

of Exhibition; Dr. T. C. Schneirla, Department of Animal Behavior; Dr. Richard G. Van Gelder, Department of Mammalogy; and Messrs. Roy A. Gallant and Richard K. Winslow, of the Natural History Press.

One manifestation of growing interest in the magazine has been the increase in the number of requests for reprint permission from magazines, books, and newspapers throughout the world, both as a result of publicity and of increasing general awareness of the publication.

The December children's book survey, together with a television program that discussed the problems of children's science books, has generated such interest that the magazine has received a request from the Rutgers Graduate School of Library Science to aid in planning a day's symposium in the autumn of 1963, utilizing our reviewing panel and designed for teachers, librarians, and publishers.

During the year, the magazine continued its steady circulation growth. Its paid circulation has reached a total of 142,538, establishing a new high for the fourth consecutive year, and representing a 20.2 per cent increase over July 1, 1961.

Gross advertising billing, ending with the June-July, 1963, issue, approximated $90,000. This is an increase in the gross of $17,000, or 24 per cent over that of 1961–1962. A total of 109 revenue pages were published during the year as opposed to 93 last year and 71 during fiscal year 1960–1961.

JUNIOR NATURAL HISTORY

Marion B. Carr, Editor

Junior Natural History ceased publication with the June issue as work went forward on *Nature and Science*, the new periodical for boys and girls nine to fourteen years old. The first issue of *Junior Natural History* was published in March, 1936, and within six months the magazine had a circulation of 15,000. By the following year requests for subscriptions had been received from as far away as Iceland, Japan, and Australia. The circu-

lation for the last issue was 42,092. Mrs. Dorothy Shuttlesworth was the founding editor, and Mrs. Carr became editor in 1949.

As has been noted in President White's message, *Nature and Science* will carry out the purposes and extend the functions of *Junior Natural History*. The Museum will continue to have the benefit of Mrs. Carr's skills and experience when she assumes the new post of Senior Editor of *Nature and Science*.

PLANT OPERATION AND MAINTENANCE

Paul Henry Grouleff, Plant Manager

Contracts were awarded during the year for four major projects, the cost of which ($1,200,000) will be paid by the city. These include the conversion of the power systems in the Museum to alternating current, which should be completed next spring; the reconstruction of the area on the first floor that is to become the new Hall of the Biology of Invertebrates; the improvement of the Seventy-seventh Street entrance and foyer; and the rehabilitation of space on the first floor adjacent to the main auditorium for installation of the Corridor of Small North American Mammals and a corridor for Eskimo exhibits.

The city is providing approximately $1,100,000 for eight other capital projects, which are now being designed. These include the rehabilitation or reconstruction of areas to provide for a new Biology of Primates exhibition, a new Hall of Eastern Woodlands and Plains Indians, a new Hall of the Peoples of Africa, and the Hall of Ocean Life. The other projects include construction of a new laboratory for the Animal Behavior department on the rear roof section of the Roosevelt Memorial building, most of the funds for which have been provided by the National Science Foundation. Construction of a new cafeteria to provide more and better eating facilities for both school groups and members of the general public also is being planned. The new cafeteria, to be situated in the basement of the African building, will have a capacity of about 750. Still another

project in the planning stage is construction of an overpass between the rear of the Museum parking lot and the first floor of the Roosevelt Memorial building, to afford convenient entry into the Museum from buses and cars.

The Custodial Services Division remains at a strength below that required for the proper exercise of its tasks. However, efforts are being made to obtain more personnel and to use the force available in the most efficient way.

The Maintenance and Construction Division has been fully occupied during the year. Seventy-three per cent of the time available was spent in repairing structures and facilities, eighteen per cent was spent in support of the exhibition program, and the remainder in staff services.

The Architectural Planning Division was dissolved during the year, and the Staff Architect was named Special Assistant to the Plant Manager. The firm of Burns and Roe, Inc., has undertaken a number of contracts requiring architectural and engineering services.

ATTENDANCE

During the fiscal year here reported on, 2,442,977 people visited the Museum, and 618,771 visited the Planetarium, making a combined total of 3,061,748. This figure represents an increase of 153,294 over the combined attendance for the preceding fiscal year.

James A. Oliver

THE AMERICAN MUSEUM OF NATURAL HISTORY

FINANCIAL STATEMENTS

FOR THE YEARS ENDED JUNE 30, 1963 AND 1962

THE AMERICAN MUSEUM OF

BALANCE SHEETS, JUNE

ASSETS:	*1963*	*1962*
Current funds:		
General funds:		
Cash	$ 302,376	$ 105,363
Accounts receivable	235,136	304,849
Inventories, principally publications, at cost	60,861	65,496
Prepaid expenses	72,947	86,397
	$ 671,320	$ 562,105
Special funds:		
Cash:		
Demand deposits	$ 440,628	$ 373,572
Time deposits	251,039	250,500
Investments (market June 30, 1963, $598,000) (Note 1):		
U. S. Government bonds	600,000	600,000
Preferred stock	2,387	2,387
Accounts receivable	17,375	30,975
	$ 1,311,429	$ 1,257,434
	$ 1,982,749	$ 1,819,539
Endowment funds:		
Cash:		
Demand deposit	$ 12,465	$ 6,497
Time deposit	700,000	400,000
Investments (market June 30, 1963, $38,990,000) (Note 1):		
Bonds	16,863,711	16,476,007
Preferred stocks	1,742,380	1,602,700
Common stocks	12,360,120	12,707,659
	$31,678,676	$31,192,863
Investment in bonds of The American Museum of Natural History Planetarium Authority, $570,000 principal amount, at cost (Note 3)	$ 425,000	$ 425,000
Pension funds:		
Cash:		
Demand deposits	$ 67,654	$ 79,578
Time deposits	500,000	200,000
Investments, at cost (market June 30, 1963, $8,405,000):		
Bonds	5,551,429	5,615,470
Preferred stocks	474,897	500,758
Common stocks	1,389,136	1,172,127
	$ 7,983,116	$ 7,567,933
	$42,069,541	$41,005,335

The accompanying notes are an integral part of these statements.

NATURAL HISTORY

30, 1963 and 1962

FUNDS AND LIABILITIES:	*1963*	*1962*
Current funds:		
General funds:		
Accounts payable and payroll taxes withheld	$ 110,938	$ 90,397
Deferred income, principally unearned subscriptions	617,891	566,084
	728,829	656,481
Deficit	57,509	94,376
	$ 671,320	$ 562,105
Special funds:		
Balances of funds received or appropriated for specific purposes	$ 1,311,429	$ 1,257,434
	$ 1,982,749	$ 1,819,539
Endowment funds:		
Endowment funds, income availale for:		
Restricted purposes	$13,786,580	$13,375,741
Unrestricted purposes	7,721,513	7,593,114
Funds functioning as endowment, principal and income available for:		
Restricted purposes	2,446,812	2,449,378
Unrestricted purposes (Note 2)	7,723,771	7,774,630
	$31,678,676	$31,192,863
Funds invested in bonds of The American Museum of Natural History Planetarium Authority	$ 425,000	$ 425,000
Pension funds:		
Pension fund balance	$ 7,980,989	$ 7,565,806
Welfare fund balance	2,127	2,127
	$ 7,983,116	$ 7,567,933
	$42,069,541	$41,005,335

The accompanying notes are an integral part of these statements.

GENERAL FUNDS
SUMMARY STATEMENTS OF CHANGES
for the years ended June 30, 1963 and 1962

	1963	*1962*
Deficit, beginning of year	$ 94,376	$ 96,689
Less, Transfer from unrestricted funds functioning as endowment	94,376	96,689
	—	—
Income:		
Appropriation from the City of New York	$1,702,175	$1,625,300
Endowment funds	1,190,722	1,183,195
Outside trusts and foundations	64,112	59,144
Gifts and grants	230,381	227,497
Other (Notes 2, 3 and 4)	504,821	415,261
	$3,692,211	$3,510,397
Expenses:		
General administration	$ 679,700	$ 685,367
Educational activities	1,472,596	1,389,075
Operation and maintenance of physical plant	1,280,794	1,227,301
Pension and other social benefits	316,630	303,030
	$3,749,720	$3,604,773
Deficit, end of year	$ 57,509	$ 94,376

The accompanying notes are an integral part of these statements.

SPECIAL FUNDS
SUMMARY STATEMENTS OF CHANGES
for the years ended June 30, 1963 and 1962

	1963	*1962*
Balance, beginning of year	$1,257,434	$1,469,547
Income:		
Endowment funds	$ 222,583	$ 216,984
Gifts and grants	801,581	714,058
Other	242,510	220,914
Transfer from endowment funds	36,000	30,000
	$1,302,674	$1,181,956
Expenditures for the special purposes and objects for which the funds were established	$1,248,679	$1,352,345
Transfer to general funds (included in general funds, other income)		41,724
	$1,248,679	$1,394,069
Balance, end of year	$1,311,429	$1,257,434

The accompanying notes are an integral part of these statements.

ENDOWMENT FUNDS
SUMMARY STATEMENTS OF CHANGES
for the years ended June 30, 1963 and 1962

	1963	*1962*
Balance, beginning of year	**$31,192,863**	**$29,830,625**
Additions:		
Gifts, bequests, etc. (Note 2)	$ 249,792	$ 106,817
Net profit on sales of investments	484,590	1,398,710
	$ 734,382	$ 1,505,527
Deductions:		
Expenditures for:		
Custodian fee	$ 5,000	$ 5,000
Plant alteration and rehabilitation	70,693	—
Transfers to general funds:		
For payment of certain expenses (included in general funds, other income)	42,500	11,600
To dispose of operating deficit of preceding year	94,376	96,689
Transfer to special funds	36,000	30,000
	$ 248,569	$ 143,289
Net additions	$ 485,813	$ 1,362,238
Balance, end of year	$31,678,676	$31,192,863

The accompanying notes are an integral part of these statements.

PENSION FUNDS

SUMMARY STATEMENTS OF CHANGES

for the years ended June 30, 1963 and 1962

	1963	*1962*
Balance, beginning of year	$7,567,933	$7,163,082
Additions:		
Contributions of members	$ 162,689	$ 158,492
Contributions of Museum	194,452	189,070
Income from investments	334,137	312,543
Net profit on sales of investments	39,309	64,058
	$ 730,587	$ 724,163
Deductions:		
Payments to members and beneficiaries	$ 310,450	$ 314,357
Expenses	4,954	4,955
	$ 315,404	$ 319,312
Net additions	$ 415,183	$ 404,851
Balance, end of year	$7,983,116	$7,567,933

The accompanying notes are an integral part of these statements.

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. Land and buildings owned by the Museum are not significant in amount. 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 years ended in 1963 and 1962, royalties received, net of expenses, amounted to $58,551 and $50,323, respectively, of which approximately $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 years ended in 1963 and 1962. These amounts are included in other income of the general funds.

4. Other income of the general funds for the years ended in 1963 and 1962 includes net income from magazine and book shop operations of $89,563 and $6,569, respectively. Gross income from magazine and book shop operations amounted to $1,094,077 and $1,024,241 for the respective years.

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, 1963 and the related summary statements of changes in funds for the 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 year ended June 30, 1962.

In our opinion, the accompanying balance sheets and related summary statements of changes in funds present fairly the financial position of The American Museum of Natural History at June 30, 1963 and 1962 and the results of its operations for the years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery

New York, August 12, 1963.

THE AMERICAN MUSEUM OF NATURAL HISTORY
PLANETARIUM AUTHORITY

FINANCIAL STATEMENTS

FOR THE YEARS ENDED JUNE 30, 1963 AND 1962

THE AMERICAN MUSEUM

PLANETARIUM

BALANCE SHEETS, JUNE

ASSETS:	*1963*	*1962*
Cash	$ 85,195	$ 57,559
Accounts receivable	1,169	2,131
Inventory, principally publications, at cost	23,444	23,386
	$109,808	$ 83,076
Equipment, fixtures, etc. (Note 1):		
Zeiss planetarium instrument, at cost	$135,059	$135,059
Less, Allowance for depreciation	23,632	16,879
	111,427	118,180
Furniture, fixtures and equipment, at cost, less allowance for depreciation, $139,526	1	1
	111,428	118,181
Building, at cost (Note 1)	569,209	569,209
Land (donated by the City of New York)	—	—
	$680,637	$687,390
Prepaid insurance	$ 2,753	$ 3,323
	$793,198	$773,789

The accompanying notes are an integral part of these statements.

OF NATURAL HISTORY

AUTHORITY

30, 1963 and 1962

LIABILITIES:	*1963*	*1962*
Accounts payable	$ 1,265	$ 2,210
4½% Refunding Serial Revenue bonds, and interest thereon (Note 2):		
Interest:		
Unpaid coupons, past-due	$259,830	$259,830
Accrued on past-due unpaid bonds	347,220	321,570
	607,050	581,400
Less, Payments on account, including $25,650 in each of the respective years	291,600	265,950
	$315,450	$315,450
Principal, past-due	$570,000	$570,000
	$886,715	$887,660

CONTRIBUTED CAPITAL AND DEFICIT:

Contributed capital:		
Charles Hayden	$156,869	$156,869
Charles Hayden Foundation	250,925	250,925
	407,794	407,794
Deficit, as annexed	501,311	521,665
	$ 93,517*	$113,871*
	$793,198	$773,789

* Denotes deduction.

The accompanying notes are an integral part of these statements.

STATEMENTS OF INCOME, EXPENSES AND DEFICIT

for the years ended June 30, 1963 and 1962

	1963	*1962*
Income:		
Admission fees less allowances and commissions	$374,687	$364,141
Special lectures and courses	13,423	14,477
Miscellaneous	4,357	4,788
	392,467	383,406
Auxiliary activity, sales booth	81,131	79,039
Total	$473,598	$462,445
Expenses:		
Preparation, presentation and promotional:		
Salaries	$155,680	$149,533
Supplies and expenses	30,827	31,377
	186,507	180,910
Operation and maintenance:		
Salaries	99,430	96,048
Supplies and expenses	32,229	31,984
	131,659	128,032
Administrative and general:		
Salaries	7,500	7,500
Pension fund, social security and other employee benefits	24,050	22,848
Miscellaneous	9,563	8,775
	41,113	39,123
Auxiliary activity, sales booth	61,562	63,887
Total	$420,841	$411,952
Income before interest and depreciation	$ 52,757	$ 50,493
Interest on past-due 4½% Refunding Serial Revenue bonds	$ 25,650	$ 25,650
Provision for depreciation (Note 1)	6,753	6,753
Total interest and depreciation	32,403	32,403
Net income for year	20,354	18,090
Deficit, beginning of year	521,665	539,755
Deficit, end of year	$501,311	$521,665

The accompanying notes are an integral part of these statements.

NOTES TO FINANCIAL STATEMENTS

1. 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. It is the policy of the Authority to capitalize only major additions and replacements of equipment, machinery and other plant items and to provide for depreciation of such items over their anticipated useful lives. Fully depreciated assets are carried at the nominal value of $1. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.

2. The Planetarium Authority bonds were purchased by The American Museum of Natural History in 1948. The Charles Hayden Foundation contributed $200,000 to the Museum toward the purchase of such bonds.

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, 1963 and the related statement of income, expenses and deficit for the 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 year ended June 30, 1962.

In our opinion, the accompanying balance sheets and related statements of income, expenses and deficit present fairly the financial position of The American Museum of Natural History Planetarium Authority at June 30, 1963 and 1962 and the results of its operations for the years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery

New York, August 12, 1963.

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