THE AMERICAN MUSEUM OF NATURAL HISTORY

NINETIETH ANNUAL REPORT
JULY, 1958, THROUGH JUNE, 1959

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THE CITY OF NEW YORK
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NINETIETH 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

An action of major importance was taken by the Board of Trustees during the past year with the adoption of a new administrative policy under the terms of which the Director of the Museum may return to full-time research, without sacrifice of income, after fifteen years of administrative service or upon reaching the age of 60. In adopting this policy the Trustees of the American Museum have attempted to offer one practicable solution to a problem that has not only affected this Museum but is also being pondered today in many similar organizations. The problem is to strike a balance between the operational pressures that confront a scholar-administrator and the yearning of the scholar to devote at least a part of his time to his particular academic or scientific studies.

Our belief is that the step we have taken offers a workable solution, for it means that from this time on a director of the American Museum may look forward to active years, after serving in an executive capacity, in which to follow the research or educational pursuits that had been curtailed during the term of his executive office.

Dr. Albert E. Parr, Director of the Museum since 1942, becomes the first person to benefit from this policy. On September 15, 1959, he will assume the post of Senior Scientist. On that date, the new director will take office. He is Dr. James A. Oliver, a distinguished herpetologist, who comes to us from the New York Zoological Society. Dr. Oliver will in a sense be

returning home, for he served on the staff of the Museum in the 1940's, and it is a great pleasure to welcome him back.

On behalf of the Board of Trustees I wish to express our deep appreciation to Dr. Parr for his dedicated service as Director of the Museum. His seventeen-year administration is notable for the establishment of an optimum climate for research and scholarship, for the development of a new philosophy of exhibition, and for the introduction of original techniques of exhibit interpretation. As he assumes his new post, we wish him many fruitful years of research.

When an institution reaches the venerable age of 90 and can look back on an uninterrupted tradition of service to the natural sciences and of interpreting them to the public, it has justifiable cause for pride. On April 6, 1959, this Museum celebrated its ninetieth birthday and received with appreciation the warm congratulations of its many friends. For all of us associated with the Museum it has been useful to pause and review the steps that were taken from the earliest days to set and maintain the high standards for which the Museum is noted.

Obviously, however, neither contemplation of the lessons of the past nor celebration of the present is sufficient. From the moment of its inception the American Museum has looked to the future. Its evolution, like the evolution of a species, has not always been predictable. It is interesting, for example, to look at the various architectural plans that were developed at different stages in the Museum's history. As late as 1931, a sketch labeled "The Museum of the Future," appearing in a Museum brochure, showed the same type of enclosed cruciform structure with four open quadrangles that had been proposed in the nineteenth century. Only three years later, with the breaking of ground for the Planetarium, this plan was materially and permanently altered.

Just as architectural plans have had to be changed, so have research, exhibition, and teaching programs required revision

and extension, for it has been Museum tradition to use our resources and materials in such a way as to fit the evolving needs of the community.

At the present time the Museum is well advanced in preparing a sequence of five halls devoted to man as a biological entity, to human behavior controlled and directed by social and cultural patterns, to the development of culture and civilization from its earliest beginnings, and finally to the history of man in this country. Concurrently, work is in progress on a complete restoration of the Hall of North American Birds—to be known as the Chapman Hall. In the next few years we plan to begin work on the new Hall of Ocean Life.

Our Planetarium has also been enlarging its programs and facilities. A very generous gift from the Charles Hayden Foundation has made possible the purchase of a new Zeiss projector, which is scheduled for installation early in 1960.

Along with these activities the Museum will, of course, continue the research and public instruction programs now in progress and initiate new ones. An important innovation this past year has been the launching of a program supported by the National Science Foundation, under which undergraduate students work directly with Museum scientists on major investigations—not only providing valuable assistance to the Museum's own research, but also significantly meeting the need of young people for training in the natural sciences.

We will also continue to communicate as effectively as possible with the large public outside the Museum, through our own publications, and through the press, radio, motion pictures, and television. *Natural History* magazine—a meeting place for scientist and layman—is enlarging its scope and content and has reached a circulation of 85,920. Our other Museum publications, both popular and scientific, are also experiencing steady growth, and are being widely distributed. In addition, we plan to bring the story of man and nature to a

large television audience through the resumption of a series of network programs during the coming year.

The growing importance of cultural exchange in the improvement of international relations is known to all of us. With each succeeding year, we become more and more aware of the role the Museum can play in this respect. Not only do our expeditions travel to remote corners of the world, but in addition—with increasing frequency—the Museum plays host to scientists from other countries who come here individually or in groups to work with our collections, to talk with our curators, and to examine our methods and facilities. We benefit from the stimulation of their ideas, their participation in meetings, and their services as lecturers and consultants. During the past year both the International Planetarium Executives Conference and the Seventy-fifth Anniversary Meeting of the American Ornithologists' Union brought scientists from Europe, Asia, and South America to the Museum. We look forward to a continuation of such exchanges in the future.

The Museum's contributions to the local, national, and world community have been acknowledged in many ways. We are grateful for the confidence that is expressed in our program but we are also aware that the potential significance of the Museum in science and education extends far beyond the present limits. We have the materials in our collections. We have the knowledge in the minds of our scientists. We have the talents and skills in the hands of our artists and craftsmen. With encouragement and with financial support, we can extend the limits of our potential for the enrichment of all whom we are privileged to serve.

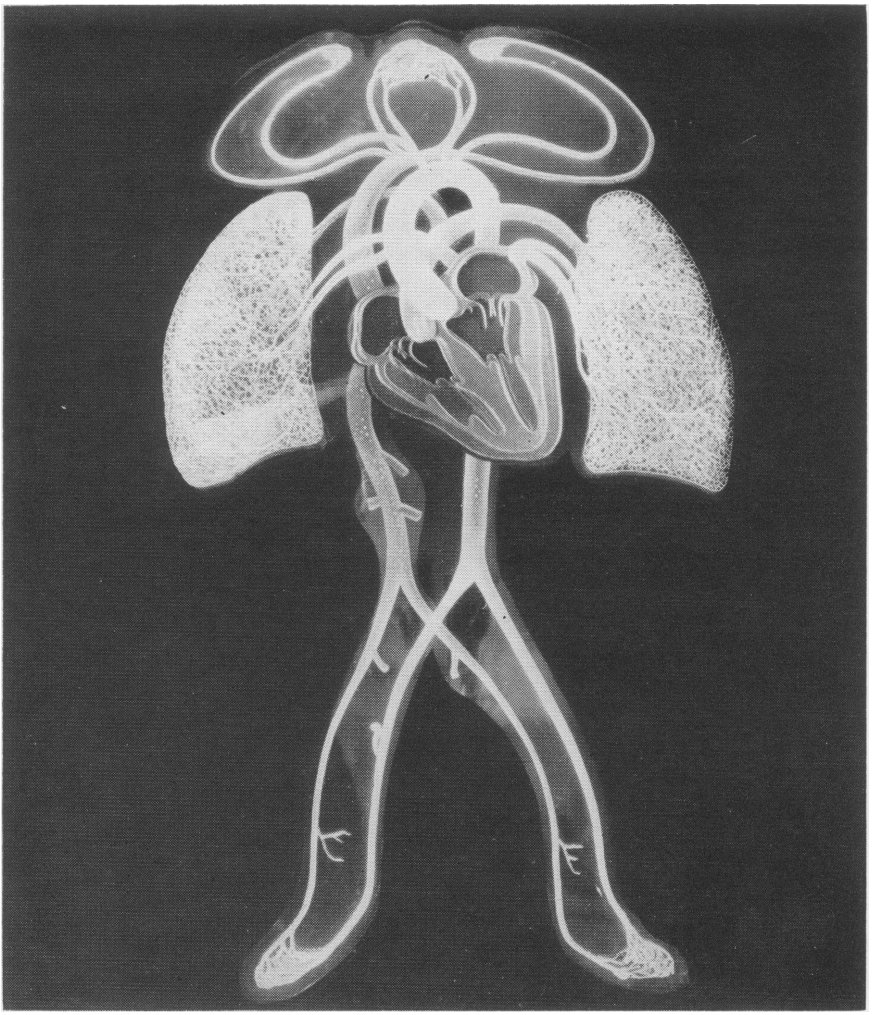
Mr. Peter R. Gimbel was elected a member of the Board of Trustees during the year.

Several new members were added to our Men's and Women's Committees, which were led by Mr. Robert G. Goelet and Mrs.

Alexander P. Morgan as co-chairmen. The two Committees, consisting of 211 members, raised $205,589 in contributions from 2307 individuals. This was the largest amount raised in the history of the Contributors Program and we wish to thank all of our friends for their welcome and much needed support.

In the twelve-month period ending June 30, 1959, the combined sources of income of the Museum, consisting of appropriations from the City, income from endowment, donations, memberships, the shop, magazines, and other activities, fell $24,628 short of meeting the Museum's operating costs of $3,162,557. This deficit was made up by drawing on unrestricted endowment funds. The endowment funds had a market value on June 30, 1959, of $33,117,937 as compared with $28,721,010 at the end of the previous year. The pension fund at the end of our fiscal period had a market value of $6,599,659 as compared with $6,169,022 in June, 1958.

Alexander M. White



The human circulatory system is shown in this figure carved in lucite. Moving dots of light trace the flow of blood through the body. The size of the heart and lungs has been exaggerated to bring out details. This model will be on display in the Hall of the Biology of Man, which is now in preparation.

THE YEAR 1958–1959

DEPARTMENT OF ANTHROPOLOGY

The projected Hall of the Biology of Man continued to be a major concern of the department under the chairmanship of Dr. Harry L. Shapiro. Progress was made on the center section of the hall during the first part of the year, and most of the exhibits for this, the major part of the hall, have been completed. It is anticipated that two of the three sections of the hall will be available and ready for installation when the architectural work is finished.

Dr. Shapiro also spent time on two important research studies. During the first half of the period he worked on the material he collected in an archeological survey of the Marquesas Islands in 1956. More recently he devoted himself to research for a UNESCO publication, to be called "The People of the Book," and for another publication tentatively entitled "The Human Species."

In connection with the first project, Mr. Robert Suggs, who aided Dr. Shapiro in his excavations and who carried out a year's field work in the Marquesas in 1957–1958, classified more than a ton of artifacts from stratigraphic excavations in fourteen sites and extensive surface collections. Analysis and study of these collections resulted in the establishment of an archeological sequence for the Marquesas Group. Several methodological advances were made beyond the limits of previous work, especially in site seriation techniques and artifact indexes, providing relative dating of sites. Heretofore, stone adzes and fishhooks were considered by students of Polynesian prehistory to be the most reliable indexes of relative chronology. The work in the Marquesas has shown that other types of artifact are more sensitive and useful than stone adzes for this purpose.

A monograph containing a full report of the excavations will be published in the *Anthropological Papers*.

Dr. Margaret Mead reported progress on a number of continuing research projects. She and Dr. Theodore Schwartz presented, at the Fifth Conference on Group Processes, the results of a study of the formation of open and closed groups based on integration of materials from fields of ethnology, cultural anthropology, and experimental and social psychology, including data from the 1953–1954 Admiralty Islands Expedition. Dr. Mead is also continuing and enlarging her data on the changing image of the scientist. Further analysis of information collected between 1956 and 1959 on attitudes towards science and space is being undertaken to shed light on cultural factors in our current attempt to change science education.

Two other members of the department, Dr. Gordon F. Ekholm and Dr. Junius B. Bird, flew to Okinawa to attempt a reconnaissance of the archeological possibilities of the islands, based on preliminary evidence discovered by an amateur archeologist with the United States Army Engineers. The purpose of the trip was to make an evaluation of the archeological resources to determine whether or not the Museum should extend its field research to this region. Although the answer proved to be negative, one excavation was made which yielded material showing that the so-called Shell Mound Culture in its later phase persisted into the seventh century A.D. and probably later.

For some time Dr. Bird has believed that one of the challenging problems in American archeology concerns the early peopling of South America. It is known that the southern part of that continent was occupied between 8000 and 10,000 years ago, yet no evidence of comparable age has been found in Middle America south of the Valley of Mexico. Last summer Dr. Bird and his son Harry intensively checked areas likely to have been inhabited in late Pleistocene time. Flights were made to Costa Rica, El Salvador, Nicaragua, Honduras, and Guatemala,

and Dr. Bird's resultant recommendations suggest that a search for early hunter remains should cover the western perimeter of a cave-bearing formation that he saw in Honduras and in some parts of southern El Salvador and Nicaragua, as well as in Costa Rica.

Dr. James A. Ford continued the archeological field project on the North Coast of Peru that he began in 1957. The primary objective of the trip was to establish, if possible, a chronology for one of the North Coast valleys in order to correlate its age with the chronologies previously established by Dr. Ford in the Trujillo area to the south and the Guayas River Valley in Ecuador to the north. Preliminary reports indicate that the Formative Culture, which came from Middle America to form the foundation for Peruvian agricultural development, bypassed the extensive deserts of the North Coast, and, by inference, must have entered the Peruvian area by way of the sierra. All the known successive time periods have been found in the two northern valleys in which he worked. Classification now in progress will result in a quantitative ceramic chronology.

"Eskimo Prehistory in the Vicinity of Point Barrow, Alaska," a major work by Dr. Ford, was published in the *Anthropological Papers* series in April, 1959.

Dr. Robert L. Carneiro continued his work on the culture of the Kuikuru Indians of the Mato Grosso in Brazil. He also made additional progress in his research on the application of scale analysis to the study of cultural evolution. In this connection he has prepared a preliminary list of 263 culture traits and eventually hopes to determine their presence or absence in a large sample of societies in order to learn what regularities exist in the order in which societies develop cultural elements.

In early April, Mr. David Hart, a former Rockefeller Foundation Fellow, departed for Morocco on a two-year field trip under the auspices of the department. He plans to do ethnological studies of the Berber tribes in that area and also to collect ethnographical material for the permanent collections

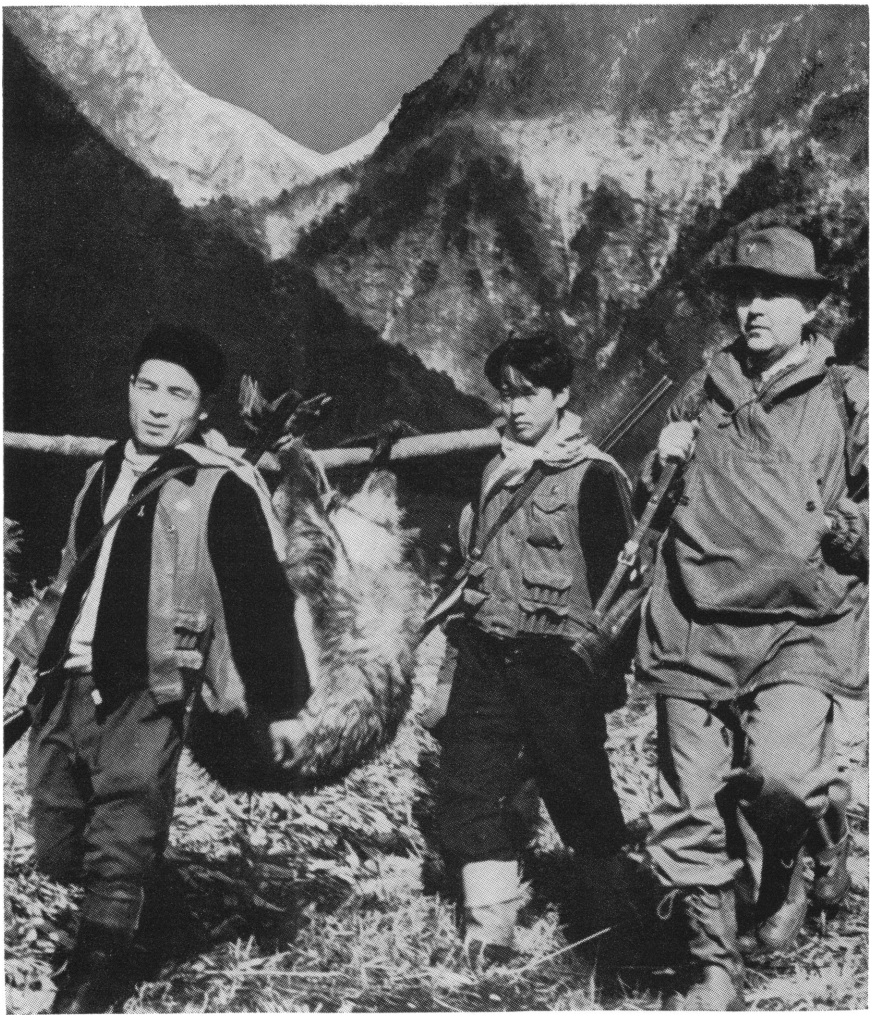
of the Museum. Mr. Hart has already completed several reconnaissance trips and is preparing to settle in a village in order to make an intensive study of one village group.

DEPARTMENT OF MAMMALS

In the Department of Mammals emphasis was centered around the continuation of broad studies of faunas and revisions of higher taxonomic categories, Dr. Richard G. Van Gelder, Acting Chairman, reports. In the former area, Mr. George G. Goodwin completed a review of the Neotropical bats of the subgenus *Natalus* and continued his research on the mammals of Oaxaca and Chiapas, Mexico. Mr. Goodwin and Mr. Arthur M. Greenhall pursued further their cooperative investigations, begun last year, on the bats of Trinidad and Tobago. Identifications of these species were furnished to the Trinidad Department of Agriculture in connection with its work on the control of rabies.

Significant progress was made in the revisions of two major taxonomic groups. Dr. Van Gelder completed and published his extensive revision of the classification of the spotted skunks (genus *Spilogale*), a project that constitutes the first part of a long-range study of the skunks of the world. Dr. Joseph Curtis Moore, continuing his studies on squirrels, completed a revised classification of the large subfamily Sciurinae. Dr. Moore also did further research towards a revision of the Oriental squirrels, of which he described two new genera and one new subgenus.

A preliminary survey of the mammals of the Kalbfleisch Field Station at Huntington, Long Island, was undertaken by Dr. Van Gelder. Preparations were made to extend the survey during the summer with the assistance of three undergraduate students, as part of a new program that is supported by the National Science Foundation, offering research opportunities to selected undergraduates. Dr. Van Gelder also gathered ecological data on mammals at the South-



This expedition prize, a specimen of the rare Japanese serow or goat antelope, was collected for the American Museum by Mr. Thomas L. Blakemore of Tokyo and Colonel R. B. White of Scarsdale, New York, with the cooperation of the Japanese government.

western Research Station in Arizona and continued his research on the mammals collected on the 1957 Puritan-American Museum of Natural History Expedition to Western Mexico.

Most notable among the 1699 specimens accessioned by the department during the year were two complete skins and skeletons and one fetus of the Japanese serow, or kamoshika *(Capricornis crispus)*. The specimens were collected by Mr. Thomas L. Blakemore and Colonel Robert Bruce White, who are believed to be the only persons ever to receive permission from the Japanese government to hunt the serow. The animal is considered a national emblem in Japan, and, while it is not rare, it is extremely wary. During 150 days of hunting, the Blakemore-White Expedition encountered only three serows, two of which were collected for the Museum. In the spring Mr. Blakemore and Colonel White began another expedition in Japan in an effort to obtain specimens of the Japanese bear for the department.

The Sixth Archbold Expedition to New Guinea entered the field in March under the leadership of Dr. Leonard J. Brass, with Mr. Hobart M. Van Deusen serving as mammalogist. The group is working in the northeastern coastal area and the mountainous interior of the Territory of Papua on the main island of New Guinea.

To complement the investigations of the fauna and flora of New Guinea and Australia made by the Archbold Expeditions over a period of years, the Spalding-Peterson Expedition departed for Australia in March under the joint leadership of Mr. Philip Spalding and Mr. Russell F. Peterson. The expedition, based initially at Cairns, Queensland, is making field studies and vertebrate collections in the rain forest, monsoon forest, and open country in northern Queensland and the eastern portion of Northern Territory. Later, the party will proceed to certain islands in the D'Entrecasteaux Group in the Territory of Papua to complete investigations started by Mr. Peterson on the Fifth Archbold Expedition to that area.

Field work by Mr. T. Donald Carter in widespread locations in the United States and Canada resulted in the collection of specimens for eight of the fourteen smaller mammal habitat groups to be installed in the corridor adjoining the west end of the Hall of North American Mammals. This important extension of the present hall is being made possible through the generosity of Mr. and Mrs. Robert D. Sterling.

Curatorial work in the department was devoted primarily to increasing the speed and efficiency in the processing of specimens and in the installation of various local collections in the general taxonomic collection. Considerable progress in decreasing the backlog of uninstalled specimens was made by Mr. Joseph A. Davis, Jr., now Assistant Curator of Mammals, New York Zoological Society, who was temporarily employed by the department in 1958.

In connection with the proposed series of volumes on the fauna of North America in memory of Theodore Roosevelt, Dr. Van Gelder prepared an outline of the topics to be included under mammals in these volumes, as well as an outline of the life history of the mountain lion.

DEPARTMENT OF BIRDS

The Seventy-fifth Anniversary Meeting of the American Ornithologists' Union was held at the Museum in the fall of 1958, with Dr. Dean Amadon, Chairman of the Department of Birds, in charge of the program and arrangements. It was a highly successful meeting, attended by ornithologists from all regions of the country and from Africa, Europe, and South America, a number of whom announced new finds and progress in their work.

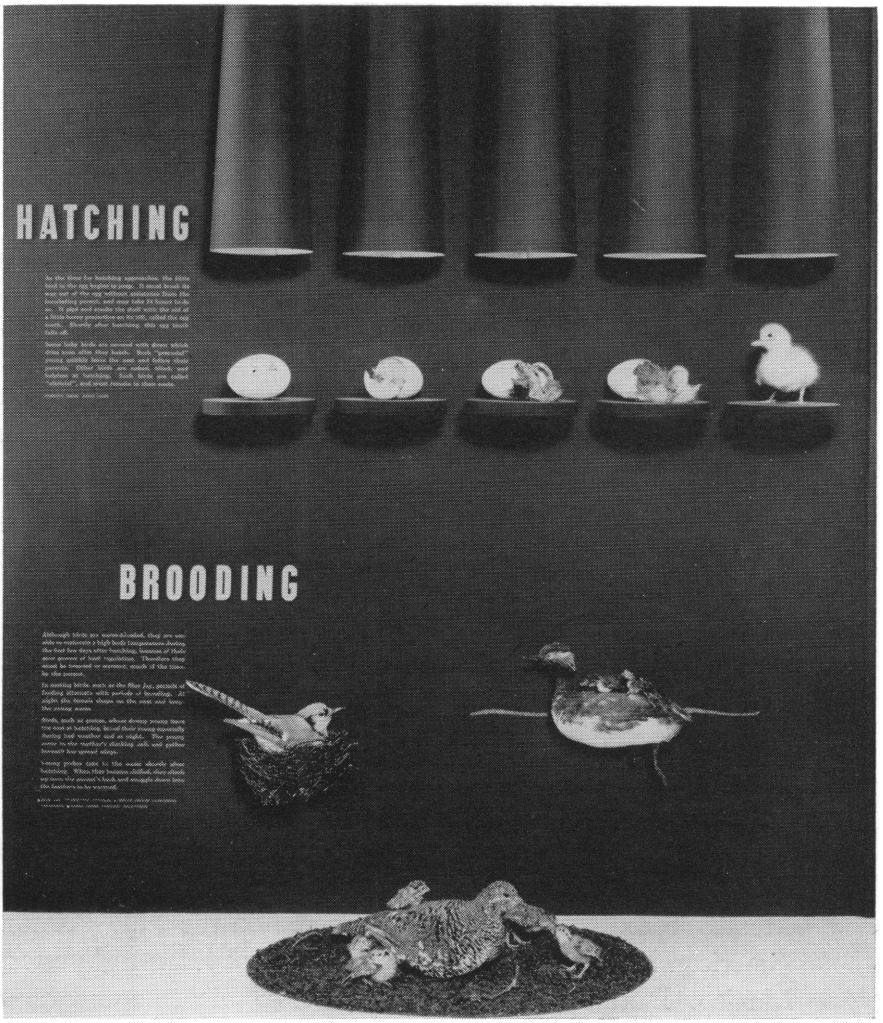
Dr. and Mrs. E. Thomas Gilliard spent nine months on an expedition to New Britain and New Guinea under the joint sponsorship of the Museum and the National Geographic Society, with a grant from the Exploration Fund of the Explorers'

Club. The object of the first part of the trip was to make an inventory of the bird life of some of the little-known mountains of the interior of New Britain Island, and also to photograph and to study the birds. Many new and interesting observations on the bird life of that island were made, and at least two new species and several new races of birds were discovered. In New Guinea the Gilliards rediscovered a rare and little-known bowerbird, among other interesting finds. On their return they brought to the Museum more than a thousand study specimens, of which about 800 were birds and 200 were mammals.

An expedition co-sponsored by the National Science Foundation and Colonel and Mrs. D. S. McChesney, and led by Dr. Wesley Lanyon, left for Central America and Mexico in the spring of 1959. Its purpose was the gathering of material for a study of the flycatcher genus *Myiarchus* and other birds of the flycatcher family. Sound recordings and photographs were made of the species of this genus found in this area. These data will later be supplemented by studies in the Museum laboratory.

In April, 1959, the alcove in the Sanford Memorial Hall of Bird Biology entitled "Eggs, Incubation, Care of Young," was opened to the public. The nesting season and all the problems of this crucial time in the life cycle of birds are described in detail in the ten panels of the new exhibition. Modern exhibition techniques, with the use of models, drawings, photographs, and actual specimens, illustrate the many diverse and often ingenious ways in which birds care for their eggs and later for their young. The alcove was given in memory of Mr. Ludlow Thomas Lanman by his sister, Mrs. Alexander M. White. Work is continuing on the two remaining alcoves in the hall, "Courtship in Birds" and "Birds and Their Environment." Other exhibition projects included work on the habitat group that is to be devoted to Japanese birds. This group, which will complete the Hall of Birds of the World, was contributed by Mr. and Mrs. Robert D. Sterling.

The first volume of Dr. Charles Vaurie's two-volume work



A new exhibition in the Sanford Memorial Hall of Bird Biology describes the birth, development, habits, and habitats of young birds, from the egg through the moment the nestling tries its wings and begins life as an adult. This panel illustrates hatching and brooding behavior.

on the birds of the Palearctic region was published early in 1959. This definitive work, which is based on years of research in the leading museums of Europe as well as in this Museum, will remain a valuable reference source for many years. Dr. Amadon, in co-authorship with Mr. Leslie Brown of Kenya, began work on a monograph of the birds of prey of the world. "Living Birds of the World" by Dr. Gilliard, published late in 1958, has already been translated into six languages.

An outstanding acquisition during the year was the purchase of almost 8000 birds from the province of Misiones in Argentina. A smaller but important collection was received from East Africa and Angola, which contained such rarities as a species of weaver hitherto unrepresented in any collection in North America.

DEPARTMENT OF AMPHIBIANS AND REPTILES

Chairman Charles M. Bogert of the Department of Amphibians and Reptiles reports that the year 1958–1959 saw the completion of an important systematic study as well as significant new findings and undertakings in the long-range research projects on temperature regulation and on the biological significance of voice.

Dr. Richard G. Zweifel completed a biogeographic study of the reptiles and amphibians of the Tres Marías Islands off Mexico, based on specimens he gathered on the 1957 Puritan-American Museum of Natural History Expedition to Western Mexico. During the course of his investigation, he uncovered several problems involving the distribution of species on the northern Mexican mainland, which required solution before the completion of the original project and which resulted in the preparation of three preliminary papers.

In the search for an understanding of the principles that govern the diversification and wide distribution of species, the department for several years has been carrying on intensive studies of the process by which lizards control their heat intake

Mr. Charles M. Bogert recorded the vocalizations of frogs and toads, using a portable tape recorder with a microphone mounted in a parabolic reflector. This field work was part of a continuing investigation of the role of voice in the behavior and evolution of frogs being conducted by the Department of Amphibians and Reptiles.

and regulate body temperature — a complex integration of physiology, structure, and behavior.

Studies of the larger iguanas of the American tropics show that bulk and shape are among the factors that limit the distribution of various species of lizards. The bulkiest lizards are restricted to tropical regions where fairly constant temperatures prevail, because their size prevents them from making the adjustments required for survival in environments where extreme temperatures occur.

The role of pigmentation in thermoregulation has been studied in the horned lizards *Phrynosoma*. Pigmentary changes have been observed to compensate, with astonishing precision, for the differences in bulk during the growing period of an individual animal. When young and adult lizards of the same species are exposed to identical heat sources, the rise in body temperature proves to be independent of size or weight, contrary to assumptions that ignore the factor of pigmentation. If young lizards were compelled to absorb heat at the same rate as their bulkier elders, while at the same time having to maintain their temperatures within the narrow zone dictated by the hereditary needs of the species, they would be forced to retreat from the sun with disadvantageous, if not disastrous, frequency.

Lizards outside the tropics have evolved behavioral traits that help to insure their survival. Lizards indigenous to temperate zones habitually seek shelter before temperatures reach levels beyond their tolerance, while closely related tropical species, unaccustomed to extremes, do not react self-protectively even when subjected to lethal amounts of heat.

An investigation of levels of heat tolerance and the effect of temperature on rates of development in frog and toad embryos was initiated during the year by Dr. Zweifel. With grants from the National Science Foundation and the Lincoln Ellsworth Fund of the American Museum, he worked at the Southwestern Research Station from June to September. A by-

product of this study was the preservation of a developmental series of the larval stages of the species under consideration, descriptions of which are being prepared for publication.

While in Arizona, Dr. Zweifel also surveyed the distribution of and variation in the whiptail lizards (genus *Cnemidophorus)* and discovered the existence of an undescribed race in an area previously thought to be beyond their range. His report on this work was published in the *Bulletin* in April, 1959.

Work continues on the long-term inquiry by the department into the biological significance of vocalization in frogs and toads. The tape library in the department was greatly enriched by recordings made during the summer in Wyoming, Utah, California, and Arizona, as well as in Mexico, where Mr. Bogert recorded the calls of the cricket-voiced cliff frog *(Tomodactylus nitidus petersi)* while observing its mating behavior. Calls tape-recorded in the field are analyzed in the laboratory by means of a sound spectrograph. This electronic device produces "pictures" of the calls of different frogs that may be studied and compared. Mr. Bogert explains that the value of the tape recorder as a taxonomic tool depends greatly upon how thoroughly the fauna is covered for the sake of extensive comparisons.

In an effort to discover the possible effect of temperature changes upon the pitch and the duration of mating calls in frogs, Dr. Zweifel devised a method for recording those of the European frog *Bombina variegata* under controlled laboratory conditions in which temperatures could be measured accurately. Spectrograms disclose that the rate of call varies directly with the heat level. Pitch (frequency of vibrations) rose with the temperature, while the duration of the individual call decreased. Because pitch, rate of repetition, and duration are among the variables that distinguish the calls of one species from those of another, it is important to know to what extent temperature must be taken into account when vocalizations are compared.

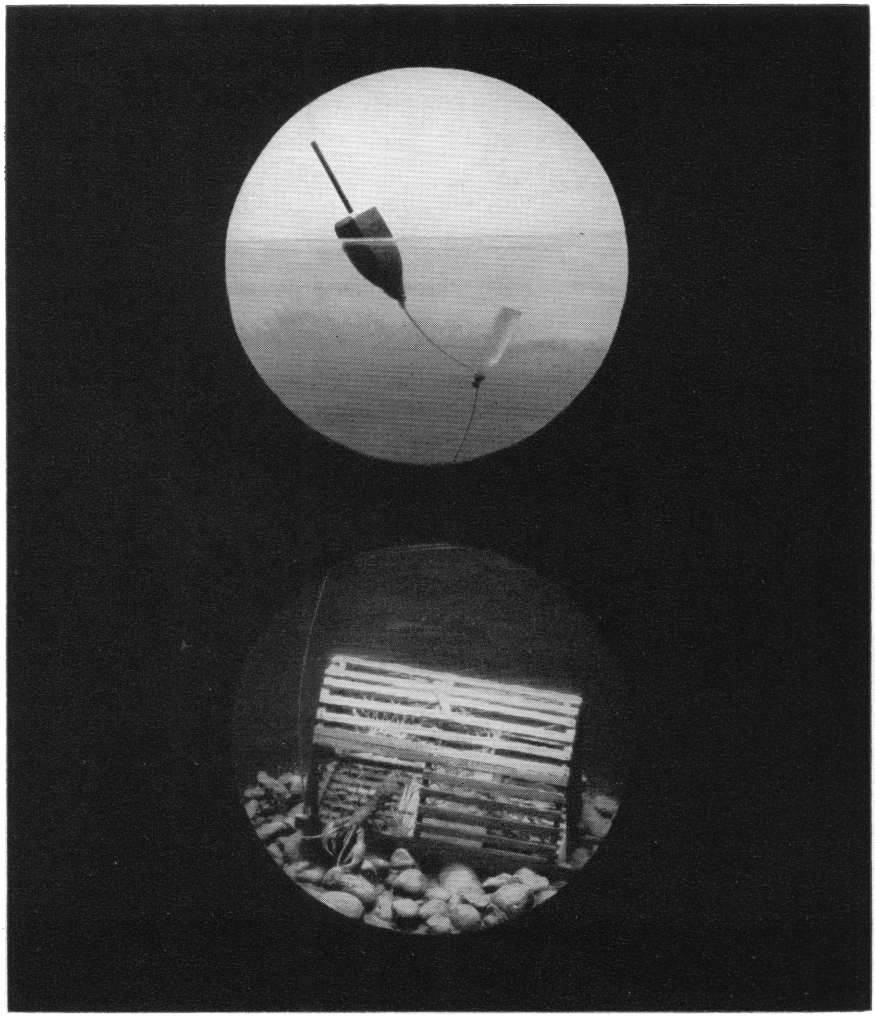
The department is grateful to several people who have this

year enriched the collections by the contribution of particularly valuable specimens. From Dr. Robert Menzies, as a result of his cruise in connection with the International Geophysical Year, came specimens of two species found only on the Round Islands near Mauritius, which previously had been unrepresented in the department collections. Dr. Sherman A. Minton, Jr., Research Assistant, currently working at the Basic Medical Sciences Institute in Karachi, is helping to fill the gaps in the collection for southern Asia. Dr. Albert Schwartz of Albright College in Pennsylvania, working on a National Science Foundation grant administered through the Museum, has already supplied 1210 specimens from Cuba, among which are several forms new to science.

DEPARTMENT OF FISHES AND AQUATIC BIOLOGY

Among the notable activities of the Department of Fishes and Aquatic Biology were the completion and opening of an exhibition on the life cycles and distribution of five species of decapod crustaceans commonly used as sea food. This extension of the Gallery of Invertebrates constitutes the first exhibit of the department in a number of years, Dr. Charles M. Breder, Jr., department Chairman, reports. Research and collection of the scientific material for the exhibit were undertaken by Dr. Dorothy E. Bliss who worked closely with the Department of Exhibition in developing the displays. Much valuable assistance was provided by several government agencies, federal and state, as well as by a large number of firms operating in the sea-food industry.

Significant progress was made in the various long-range research projects of the department. Dr. William K. Emerson continued his studies of the metazoan faunas of the late Pleistocene marine embayments of northwestern Baja California and southern California. Aided by a grant from the Society of Sigma Xi, he collected material in several locations in southern California, which, together with similar material from Baja



In the newly opened exhibition "Shrimps, Lobsters and Crabs: Much Ado About Decapod Crustaceans," miniature dioramas such as this under-water window view of a lobster fishing scene reveal the remarkable precision and devotion to detail characteristic of Museum workmanship.

California, he will use to run oxygen-18 isotopic measurements in order to determine temperatures in the paleohydroclimates. In this connection, plans were made whereby Dr. Emerson will work on these isotopic determinations during the summer with Dr. Harold C. Urey at the Scripps Institution of Oceanography. Dr. Emerson also pursued his research on the classification of the scaphopod mollusks, with the hope of completing a revision of this group, together with a review of the species of the eastern Pacific, within a year.

Dr. Breder's extensive monograph on the reproductive habits of fishes is approaching completion. A considerable portion of his field work during the year was devoted to the study of the life histories and habits of fishes on the west coast of Florida, work that constitutes a continuation of the studies that he made in that area between 1938 and 1942. Of particular interest during the past year were his observations on the courtship and spawning behavior of the needlefish *(Strongylura notata),* a member of the family Belonidae. While no information has ever been published on the reproductive behavior of any member of this family, Dr. Breder worked out the development of the needlefish eggs, based on artificially fertilized stripped eggs, in 1940. His notes from that study, together with data from his recent observations, will form a valuable contribution and will, incidentally, fill a gap in his document on reproductive habits. In other observations, Dr. Breder obtained data on the nesting habits and egg protection by the males of *Chasmodes bosquianus,* a blenny, and the developmental stages of the postlarval *Tylosurus acus,* a synentognath, on which he had previously published a number of studies. In addition, he obtained other data for the completion of his manuscript on the characteristics of fish assemblages, a study that was published in June.

Dr. Breder, from an operational base on Lemon Bay, Florida, made tow-net collections of fish eggs and larvae during the year. These, together with earlier collections from nearby loca-

tions, are expected to provide the basis for a comprehensive study of the ecology of fish reproduction in this area.

Miss Francesca R. LaMonte pursued her investigations of speared fishes with field research in the Hawaiian Islands. She worked chiefly on the island of Kona where she was able to study fresh specimens of Pacific marlins. Some unexpected results caused her to postpone a paper that was nearly ready for press, and plans were made whereby she will return to the islands during the summer of 1959 for further study.

The fifth volume of Dr. Libbie H. Hyman's monumental work on the invertebrates appeared this year, and Dr. Hyman devoted the major part of her time to volume 6 of this huge undertaking. She also continued her taxonomic studies of free-living flat worms. Dr. Horace W. Stunkard concerned himself primarily with the development and morphology of parasitic worms and continued earlier studies of parasites and predators on the green crab with field work at the Marine Biological Laboratory at Woods Hole in Massachusetts. In the interests of the United States Fish and Wildlife Service, he investigated parasites and predators on oyster drills at Pensacola, Florida.

The preparation and testing of some elaborate equipment received from the Goodyear Aircraft Corporation for investigations by Dr. Vladimir Walters on the metabolism of marine fishes were somewhat delayed by technical difficulties. The pilot plant installation has been assembled, however, and has been demonstrated to perform satisfactorily. Dr. Walters devoted part of his time to studies on abyssal fishes, preliminary to his revision of the groups to be included in volume 3 of "Fishes of the Western North Atlantic."

Dr. Dorothy E. Bliss, with the able assistance of Miss Jane Rouillion, continued her investigations on the control of growth and water metabolism by the neuro-endocrine system of the land crab, *Gecarcinus lateralis,* as well as on neurosecretory control of the diurnal rhythm of activity in the same crab. Support for this research derives partially from a National

Science Foundation grant. During the year Dr. Bliss devoted considerable time to the preparation of manuscripts for publication as well as papers for delivery at various professional meetings and symposia on several aspects of her research.

Analysis of the reactions to light and the reproductive methods of cave *Mollienisia* was carried on by Miss Lisa Hamilton with the aid of a National Science Foundation grant. The continuation of this work required a new supply of both preserved and living fishes, and these were acquired through the services of Mr. Alfred Dinkins of the San Antonio Zoo and Aquarium in Texas. The living specimens are now forming the basis for a more detailed and refined analysis of the ecology of these fishes.

A significant step in the curatorial work of the department was the reactivation of the mollusk reference collection by Dr. Emerson with the assistance of a grant from the National Science Foundation. Plans were made for the reorganization of the rather small, but valuable, collection of preserved fishes.

During the early part of the year under consideration, Mr. John T. Nichols continued his work with new accessions and with material brought to the department for identification. His death on November 10, 1958, terminated a long and distinguished career in ichthyology. His many years of association with the department and the fact that he continued his studies to the end, although he had been on the emeritus list since 1952, contributed to the acuteness of the loss felt by his colleagues.

Dr. Willard G. Van Name, a curator emeritus since 1942, died on April 25, 1959. He had been in precarious health for a long period and had not been at the Museum since 1954. Dr. Van Name, whose association with the Museum began in 1917, will be remembered not only for his achievements in invertebrate zoology but for his efforts on behalf of wild-life conservation.

DEPARTMENT OF INSECTS AND SPIDERS

The year 1958–1959 brought to its final stages a project with which the department has been concerned for 20 years, the publication of a comprehensive treatise on "Butterflies of the American Tropics." A grant from the National Science Foundation has enabled the department to go ahead with plans for publication of the first volume, "The Genus *Anaea*."

One of the most popular gifts the Museum has received in some time was a live male specimen of *Goliathus goliathus,* the goliath beetle from French Equatorial Africa, and the bulkiest insect known. This specimen was put on exhibit at the end of 1958 and has had enormous attraction for the visiting public. Widespread coverage, in national and foreign newspapers and magazines, of the beetle's activities brought to the Museum thousands of visitors eager to see for themselves a living specimen of this insect.

Dr. Mont A. Cazier, Chairman of the department, began two research problems at the Southwestern Research Station during the fall of 1958. One of these concerns the ecology, behavior, and biology of the twig-girdling beetles belonging to the family Cerambycidae. This project will be continued during 1959. The second involves the study of the myrmecophilous scarabs belonging to the genus *Cremastocheilus.* A large colony of these was located near Patagonia, Arizona, and to date the ants associated with the beetles have been collected and identified, and numerous ant hills into which beetles were seen to enter have been marked for excavation during the summer of 1959.

Dr. C. Howard Curran has continued his study of the biology and control of insect and plant pests at Bear Mountain and of the Mydaidae and Syrphidae. Dr. Willis J. Gertsch is engaged in a study of the spider genus *Loxosceles,* and the *Steatoda fulva* group, as well as a revision of the family Symphytognathidae. An extensive field trip to California made by Dr.

Gertsch and his son John yielded a sizable collection of spider specimens.

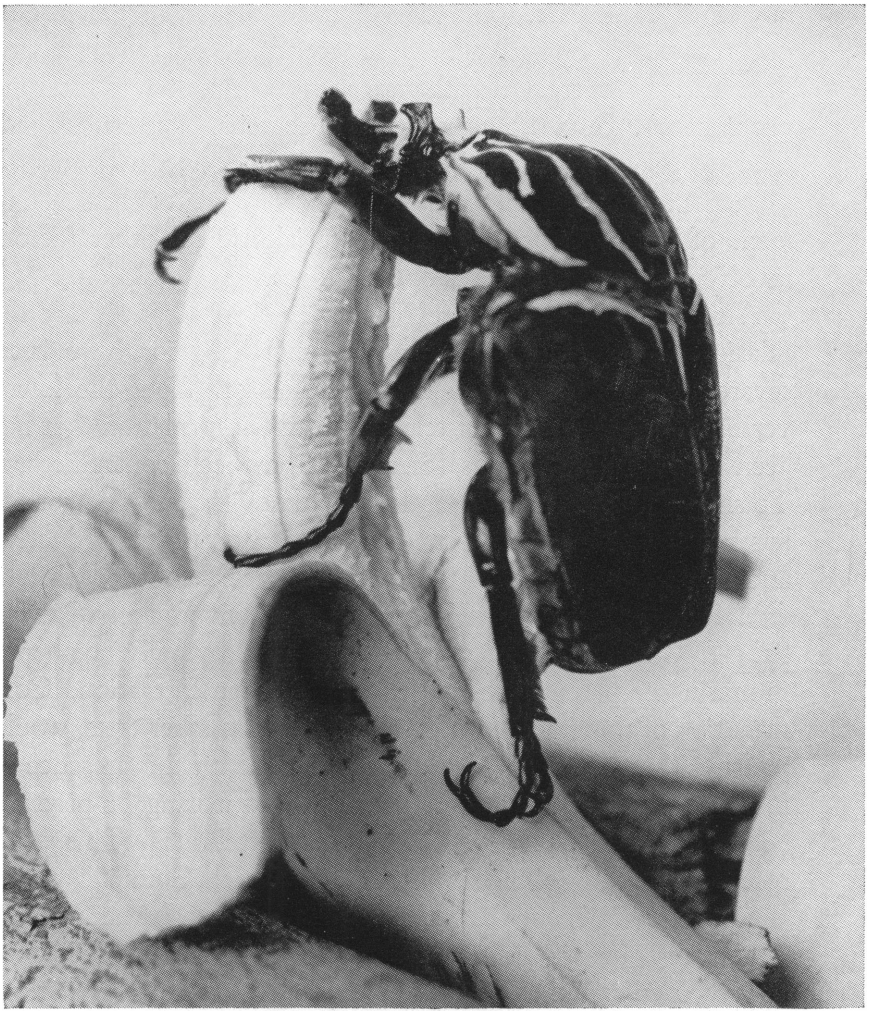
Dr. Frederick H. Rindge has completed a revision of the geometrid genus *Glaucina* and allies and is now working on a revision of a small tribe of Geometridae. He has also taken on the task of accessioning the Otto Buchholz collection of 125,000 American moths and butterflies. This collection, the finest one of its kind still in private hands, was acquired early in 1959. Its assimilation into the collection of the department is a considerable task, which, it is expected, will take several years to complete.

The department received three additional grants from the National Science Foundation during the year, one in support of a research project entitled "Systematics and Biology of the California Spider Fauna," under the direction of Dr. Willis J. Gertsch, another in support of a research project on the longhorn beetle being conducted by Dr. Frederico Lane, and a third grant to Dr. Frederick H. Rindge for his work on the "Revisionary Studies of the Genera of North American Geometridae."

DEPARTMENT OF ANIMAL BEHAVIOR

Dr. Lester R. Aronson, Chairman, reports significant new findings and new undertakings in a number of long-range departmental investigations which are attempting to explain such basic phenomena as the role of hormones in sexual and parental behavior, the effects of early stress on the ability of an animal to adjust to problems in adulthood, some biological principles involved in bird migration and schooling in fishes, and the biological significance of the sounds made by under-water creatures.

For several years, Dr. Aronson has been studying the function or hormones, seeking to determine in what manner and to what degree they effect and modify behavior. During the past year, with the assistance of Dr. Jay Rosenblatt, he worked on a comparative study of normal and hormonally induced sexual be-



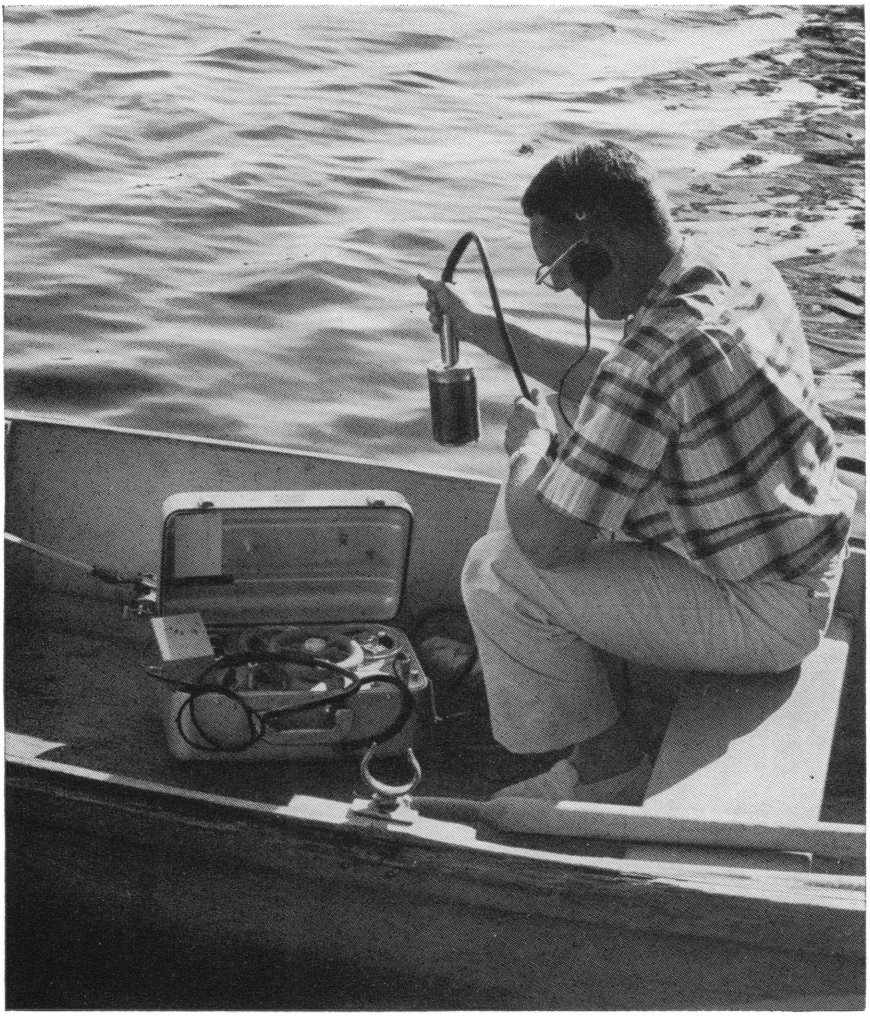
A rare, live specimen of the beetle Goliathus goliathus *was placed on exhibit and delighted thousands of visitors with its incredible size and brilliant coloring and its practice of peeling bananas.*

havior in male cats. The development of sexual activity at puberty was compared with the reactivation of such behavior in castrated cats treated with androgenic hormone (testosterone propionate). Tests show that sexual behavior, once established, tends to remain fixed, and that the male hormone, while it provides the morphological and physiological milieu for the development of sex patterns, does not materially affect other factors involved in the performance of the sex act.

Attempts to develop an evolutionary theory concerning the relation of gonadal hormones to sexual behavior have been severely hampered by a lack of information about the lower vertebrates. In the case of teleost fish, the information that has been gathered by various researchers has been contradictory. To shed some light on this vital area of knowledge, Dr. Aronson has been studying the effects of castration on the reproductive and parental behavior of the male blue acara *(Aquidens latifrons)*. Assisting him are Messrs. Harold Silverman and Allan Scharf. Observations to date have revealed virtually no change in mating or parental behavior resulting from castration. Confirmation of this evidence, if forthcoming in further tests, would indicate that male acara are not dependent on the presence of testicular hormones for the appearance of mating or parental behavior to the extent noted in higher vertebrates. This work received support from the National Research Council.

Dr. Aronson spent the summer of 1958 at the Lerner Marine Laboratory amassing data for his monograph on the behavior and ecology of the West Indian pearl fish *(Carapus bermudensis)*. These unusual fish live within the bodies of sea cucumbers. Photographs taken on the spot will be used in a forthcoming article in *Natural History,* and footage was taken for a proposed film on the subject.

Dr. Theodore C. Schneirla's study of the effects of stress is in its second pilot year, during which time the vast job of preparation was continued with the assistance of Dr. Ethel Tobach, Dr. Leo Vroman, and Messrs. Gerald Turkewitz, Joseph Gitlin,



The sounds of under-water animals are being recorded by Dr. William N. Tavolga of the Department of Animal Behavior as part of a long-range study of their biological significance.

and Robert Statler. A strain of Wistar rats was selected as the experimental animals, and the techniques and equipment for testing were planned and made ready. Young rats, after being subjected to unstable social and physical conditions in the early stages of their lives, will be put through a battery of stress tests to show whether and in what ways differently trained individuals vary in their reactions to such situations as extremes of light and sound, changes in the physical environment, and similar "problems." Funds from the National Institutes of Mental Health are supporting this work.

The study of sounds made by under-water creatures has been of increasing interest to oceanographers, marine engineers, and naval authorities. Dr. William Tavolga, after completing his original project in which he determined the specific role in mating behavior of sounds made by certain tidal-zone fishes, began work on studies of the toadfish and the marine catfish.

The loud fog-horn-like sounds of the toadfish have long been considered to be related to spawning activity, but Dr. Tavolga's present work indicates that they also serve a function in the maintenance of territory and, possibly, in species discrimination.

Preliminary work with two species of catfish indicates that the sounds of these fish, which vary greatly in pitch, duration, and timbre, may figure in the means by which the fish maintain clearly defined schools at night or in turgid waters.

Dr. Tavolga, who is working under contract with the Office of Naval Research, spent several months at the Cape Haze Marine Laboratory and at the Marineland Research Laboratory, both in Florida.

The study of schooling behavior in fish was greatly expanded during the year. Dr. Evelyn Shaw, working at the Museum and at the Woods Hole Marine Biological Laboratories, continued experiments on the influence of such factors as visual stimuli, parental behavior, and isolation. Fry of the common silverside *(Menidia menidia),* reared without parents, did not school at all, and the highest percentage of schooling behavior was noted

in acaras which had received the greatest amount of consistent parental attention. Young acaras raised in isolation would school with already schooling groups when placed among them, but groups of young, all of which had been raised in isolation, did not school when placed together in a tank. Support for Dr. Shaw's project comes from the Office of Naval Research, the National Institutes of Mental Health, and the National Science Foundation.

To arrive at a clearer understanding of the biological processes at work in bird migration, intensive, quantitative tests on sensory capacities are being conducted by Dr. Helmut E. Adler, using starlings as his first experimental animals. To date Dr. Adler has been able, through his tests, to chart with a high degree of precision the spectral sensitivity of the starlings, that is, the minimal amount of light required to discern specific colors. Still in progress are tests that will measure the visual acuity of the birds and their ability to adjust to seeing in dim light.

If, as is currently believed, birds migrate by a system of orientation to the sun, constellations, and stars, they must be able to discriminate relatively small periods of time with great accuracy in order to stay on their course. Dr. Adler has been designing equipment and preparing experimental animals for tests that should yield specific data on exactly how the birds can gauge periods of time. Dr. Adler's work is being supported by a National Science Foundation grant.

A study of the development of nursing behavior in kittens was initiated by Dr. Jay Rosenblatt. By pre-loading the stomach of a kitten at six days of age and at spaced intervals thereafter, he is attempting to influence normal nursing patterns. Results show that kittens, until they are about 35 days old, react to the close contact with the mother's body by initiating nursing behavior with no apparent relation to actual hunger. Later, the condition of the stomach begins to influence behavior when the kitten has less constant contact with the mother and must approach her from a distance in order to nurse.

The department is pleased to report that Miss Miriam Dick, a high school student volunteer who has been working in the department, won a Westinghouse Science Talent Search scholarship based in part on a research project conducted under the guidance of Drs. Tobach and Schneirla.

The sudden death of Dr. Myron Gordon, Research Associate of the department, on March 12, 1959, came as a great loss to the Museum. Dr. Gordon was a distinguished scientist who will be remembered by the members of the department as an outstanding biologist, an investigator of marked originality, a valued colleague, and a warm friend.

DEPARTMENT OF VEGETATION STUDIES

Dr. Jack McCormick, in charge of Vegetation Studies, began field work in the summer of 1958 on a three-year study of the vegetation of the Chiricahua Mountains, southeastern Arizona, a project financed by the National Science Foundation. He made extensive explorations of the area by "jeep," horseback, on foot, and by airplane. Quantitative studies to determine the species of plants, their cover, and their spatial relations were begun in oak-juniper woodland, semi-desert grassland, mesquite savanna, and creosote-bush scrub. The following spring, Dr. McCormick began the mapping of the vegetation from air photographs and ground reconnaissance, and prepared a preliminary draft of a vegetative key to the trees, shrubs, yuccas, agaves, sotols, and cacti of the region. With the aid of four field assistants, he also began quantitative work on other vegetation types, from tarbush and desert scrub at 4000 feet to spruce and Douglas fir forests at 9700 feet. In addition, he devoted considerable study to the history of the Chiricahua area to determine the influences of settlements, mining, grazing, fire, and other factors on the vegetation.

Dr. McCormick's book, "The Living Forest," based on the Hall of North American Forests, was published early in 1959 and was designated the selection of the month by both the

Natural History Book Club and the Outdoor Book Club.

The exhibition plan for the Hall of Plant Science was prepared in outline during the year, and preliminary work was begun on an insectivorous plant exhibit for the proposed hall. In connection with this project, Dr. Erika Rawitscher was appointed Consultant in Botany.

DEPARTMENT OF GEOLOGY AND PALEONTOLOGY

It is with mixed feelings of both pride and regret that the department announces the resignation of Dr. George Gaylord Simpson from the staff, after 33 years with the Museum. Dr. Simpson will leave to become an Agassiz Professor at Harvard University. The post, which is a signal honor in the academic world, will enable him to spend as much time as he chooses in research.

During the year an expedition under the direction of Dr. Simpson made a collection of fossil teeth and jaws through the use of washing techniques applied on a large scale for the first time in the history of the department. A large series of Eocene mammal teeth and jaws were found in New Mexico, and many tons of sediments were excavated at the site and transported for 50 miles or more by truck to a river where the sediments could be washed down in special boxes made for the purpose. In this way the small fossils were screened out of the sediments, and the collection was accumulated.

Dr. Simpson also carried forward several research projects, including a large study on the nature of the fossil record and the history of life, and in addition, shorter studies on Darwin, on man's evolutionary future, and on supraspecific taxa. He completed a revision of "Quantitative Zoology" in collaboration with Dr. Anne Roe and Dr. Richard Lewontin.

Dr. Edwin H. Colbert, Chairman of the department, spent some time in Brazil working in collaboration with two Brazilian paleontologists, Drs. Carlos de Paula Couto and Llewellyn Price. The Museum acquired, as a result of this field work, a

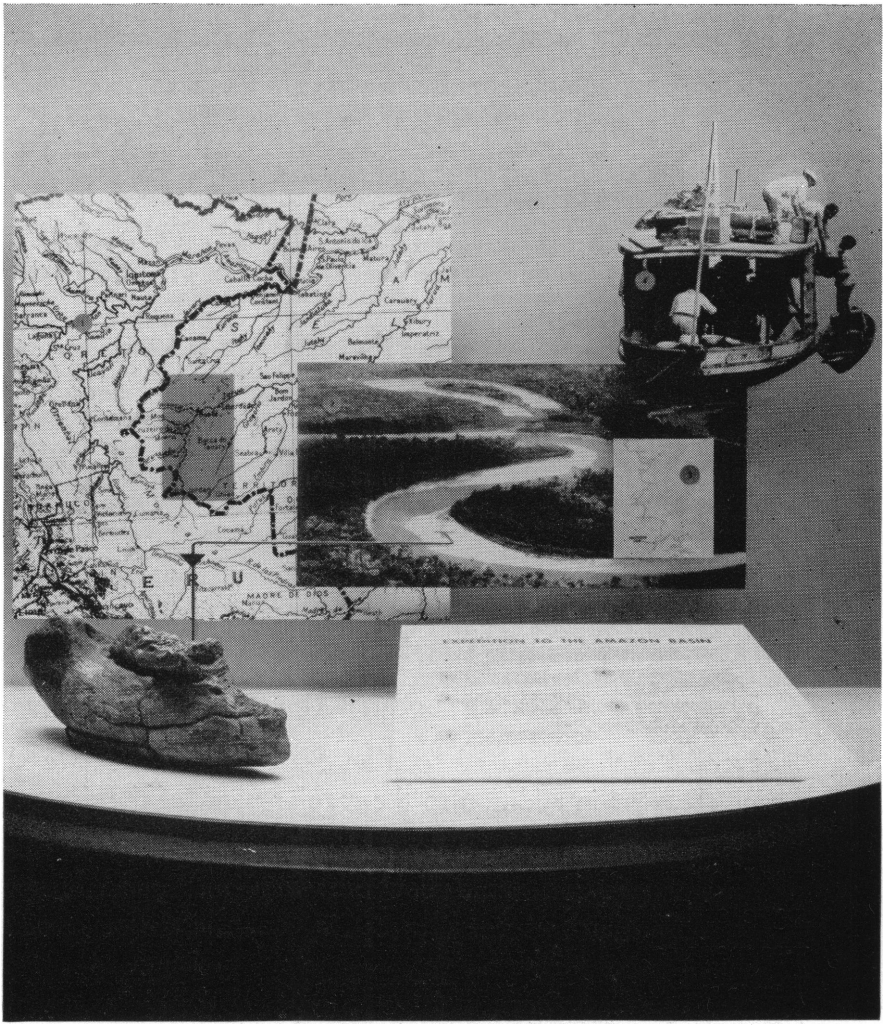
fine representation of Triassic fossils, of which a considerable series of mammal-like reptiles is particularly significant. Also, as in previous years, Dr. Colbert continued his studies of Triassic and other Mesozoic amphibians and reptiles.

An excellent collection of fossil fishes was made from the Jurassic beds of Wyoming and from the Triassic sediments of Idaho during the field season of 1958, by Dr. Bobb Schaeffer and Mr. Walter Sorenson. Dr. Schaeffer's long-range work on the Mesozoic fish faunas of the world progressed satisfactorily. This project, begun five years ago, will assemble the available information on the composition of these fish faunas, their paleoecology, their exact age, their stratigraphic position, and on the paleogeography of the time intervals and areas that are represented. Most of these data have now been assembled and will be used for an extended analysis of faunal changes in the Mesozoic, particularly in relation to the evolution of the various groups of fishes represented in these faunas.

Although field and laboratory work has been completed on an ecological-geological study of the great Bahama Bank, Dr. Norman D. Newell continues to collaborate with Dr. John Imbrie and Mr. Edward G. Purdy in studies of the Bank. Their comprehensive report on organism communities and bottom communities was published recently in the *Bulletin*. Dr. Newell also worked on the volume on Pelecypoda for the "Treatise of Invertebrate Paleontology."

Dr. Donald F. Squires continued his studies on corals. In connection with these he collected a series of live corals in the West Indies and installed them in an aquarium containing circulating sea water in which the animals were kept alive for several weeks. This was a very arduous and delicate piece of research and represents a true pioneering effort in experimental work on living corals. In February Dr. Squires left New York for New Zealand where he will spend a year studying fossil corals on a Fulbright Fellowship.

Dr. Brian H. Mason worked in the laboratory on the rocks



A recent Museum expedition is described in a new exhibit in the Giant Sloth Hall. A map shows the area of western Brazil that was explored. Photographs show the river terrain and the boat that transported the scientific team, headed by Dr. George Gaylord Simpson. Also on view is an actual fossil find, part of the lower jaw of a mastodon.

and minerals collected in the Southern Alps of New Zealand, and a short paper describing the occurrence of exinite in these rocks has been completed. He has also undertaken a comprehensive description of the mineralogy of New Jersey trap rocks at the request of the New Jersey Geological Survey and has examined material collected by various Museum expeditions in past years. In March and April he spent six weeks visiting institutions, mineral deposits, and mineral dealers in the United States and Canada.

Exhibition work included the completion of ten displays for the Hall of the Giant Sloth. An exhibit of the fossils of the New York City region, both vertebrates and invertebrates, is ready for installation.

The display of carved jades from the William Boyce Thompson collection was installed in the Morgan Memorial Hall of Minerals and Gems. Exhibits of new minerals and of uranium minerals from around the world, installed in the same hall, have received much favorable attention.

DEPARTMENT OF MICROPALEONTOLOGY

Several developments of considerable importance occurred during the year in addition to the regular work of the department, reported Dr. Brooks F. Ellis, Chairman. The first of these was the issuance of the first copies on microfilm of the "Catalogue of Foraminifera." The decision to issue such an edition was made early in 1958, but it was not until the second half of the year that the first ten sets were completed and ready for distribution. Almost before completion, all ten were assigned to new subscribers. New copies are now being prepared for other subscribers on the waiting list. The significance of this development cannot be overemphasized, because it provided a practical means of expanding indefinitely the number of subscribing members of the department, Dr. Ellis explained.

The sizable expansion of the laboratory services of the department was another significant development reported by Dr. Ellis.

In order to study fossil spores and pollen grains, Mr. Richard Chiappetta, a graduate student and technical assistant to Dr. Brooks F. Ellis, uses powerful acids which dissolve the rock matrix without destroying the fossil material.

These services, carried out for an increasing number of corporations concerned with petroleum exploration, have involved a variety of jobs ranging from the identification of isolated samples of rocks specimens containing microfossils to the establishment of whole reference sections in various parts of the world. To make accurate determinations of these sections, the laboratory studied, in addition to animal microfossils, fossil plant spores and fossil pollen. Such an analysis required the development of numerous new techniques.

Work on the first phase of the Carter Oil Company project on microforaminifera was completed during 1958–1959. It was determined that the group, as described in the literature, is a heterogeneous one. Some microforaminifera are the chitinous linings of normal-sized forms, others are juveniles, and still others are the early stages of polymorphic forms. In addition, there are genuinely small adults that are either size variants of larger forms or represent a hitherto unknown part of the life cycle. The identity of these latter forms remains to be established. This phase of the work is being carried on as a departmental project in cooperation with the Department of Biology of New York University.

Another research project carried on in conjunction with New York University is the Long Island Sound Project. The sea-going laboratory, "Sea Owl," had an active summer and fall and is being used again during the summer of 1959. A new sedimentologist, Dr. Alastair McCrone, has been added to the research group working on the ship.

The quarterly *Micropaleontology,* published by the department under the editorship of Dr. Ellis and Miss Angelina Messina, continued to expand. Both the number of printed pages and the number of plates were increased to accommodate the large backlog of papers. Despite this expansion, papers are delayed from six months to a year before publication. It seems clear that either a further expansion will be necessary or acceptances must be curtailed, Dr. Ellis reported.

DEPARTMENT OF ASTRONOMY AND THE AMERICAN MUSEUM-HAYDEN PLANETARIUM

Mr. Joseph M. Chamberlain, Chairman of the American Museum-Hayden Planetarium, reports that the continued improvement of facilities, as well as expanded research and educational activities by members of the staff, helped to achieve the most effective balance in many years among the entertainment, education, and research functions of the organization.

The sky presentations, prepared under the direction of Mr. Thomas D. Nicholson, continued to illustrate and interpret a wide range of celestial subjects, from the most recent advances in astronomical research to various methods of traveling to the moon that have been proposed from ancient times to the present. Mr. Nicholson, with the help of other staff members, devoted considerable time to research for new show materials. To improve the effectiveness of the sky shows, a diagnostic speech survey of the entire lecture staff was undertaken with the services of a speech analyst.

Early in 1959, the Planetarium received a grant from the Charles Hayden Foundation for the purchase of a new Zeiss projector. The instrument is now being constructed, and delivery is expected early in 1960. Supplementary improvements in the sky theater, effected during the past year, included the repainting of the dome and sidewalls and the installation of a third sound-system rack containing a tape reproducer-recorder and a 40-watt amplifier.

A new era of international cooperation among planetariums opened in May when the Planetarium played host to the first International Meeting of Planetarium Executives. In attendance were 30 officials of major planetariums in Brazil, England, Germany, Italy, the Netherlands, Poland, the Soviet Union, the United States, and Uruguay. The meeting served to establish excellent rapport among the delegates, as well as to achieve a

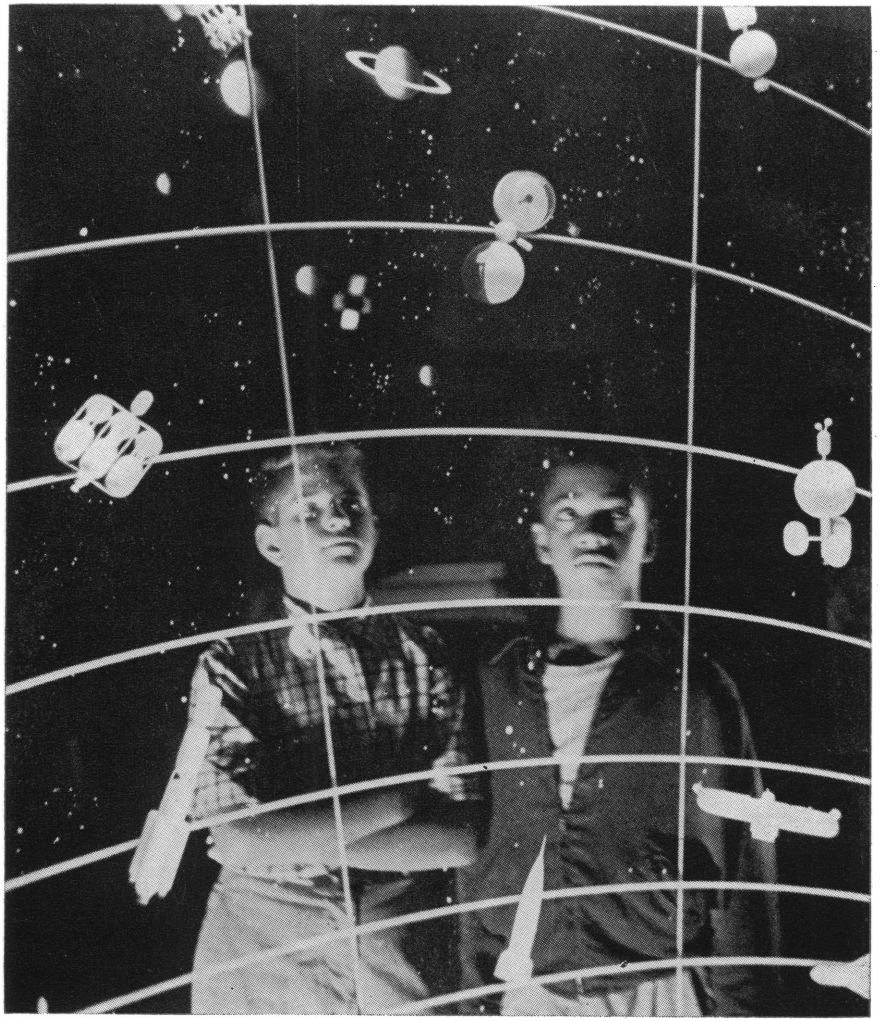
valuable interchange of information and ideas on matters of mutual interest.

Increased professional activity by members of the staff continued to enhance the standing of the Planetarium as a scientific organization. In the summer of 1958, Messrs. Chamberlain and Nicholson went to Greenland to establish the geodetic coordinates of several locations of interest to the United States Air Force in connection with the Distant Early Warning Line. Among these locations were some at altitudes of 8000 to 10,000 feet on the ice cap where no geodetic work of any kind had previously been attempted.

Equipment for the radio astronomy research project headed by Dr. K. L. Franklin was installed, with a preliminary antenna system, at the Kalbfleisch Field Station near Huntington, Long Island. Dr. Franklin was able to obtain some records showing effects of solar activity on ionosphere-propagated interference. As part of the undergraduate training program sponsored by the National Science Foundation, two students were chosen to assist Dr. Franklin in this research during the summer of 1959.

As a first large-scale venture into educational television, the Planetarium cooperated with the Metropolitan Educational Television Association in its production of a series of thirteen half-hour programs constituting a course in basic astronomy. Mr. James S. Pickering prepared the program content and appeared on camera as the instructor. The series, entitled "Astronomy for You," was sponsored by the National Educational Television and Radio Center, which began distribution of prints to educational channels throughout the country in the spring of 1959.

Under the direction of Dr. Franklyn M. Branley, the educational services of the Planetarium were expanded with the addition of a graduate course in astronomy for teachers (presented in cooperation with New York University), a special series of lectures on the International Geophysical Year, a course in astronomy for engineers, and one in astronomy for young people. In addition, plans were made to present a four-



Looking to the future in the age of space travel, two young visitors at the American Museum-Hayden Planetarium study some of the advanced space vehicle models displayed in an exhibit sponsored by the Republic Aviation Corporation.

week intensive training program in astronomy and space science for high school students during the summer of 1959. Funds for this project were provided by the National Science Foundation.

Dr. Branley continued his writing of highly successful science books for young people with the publication of five new volumes on subjects ranging from astronomy and artificial satellites to the principles of sound transmission.

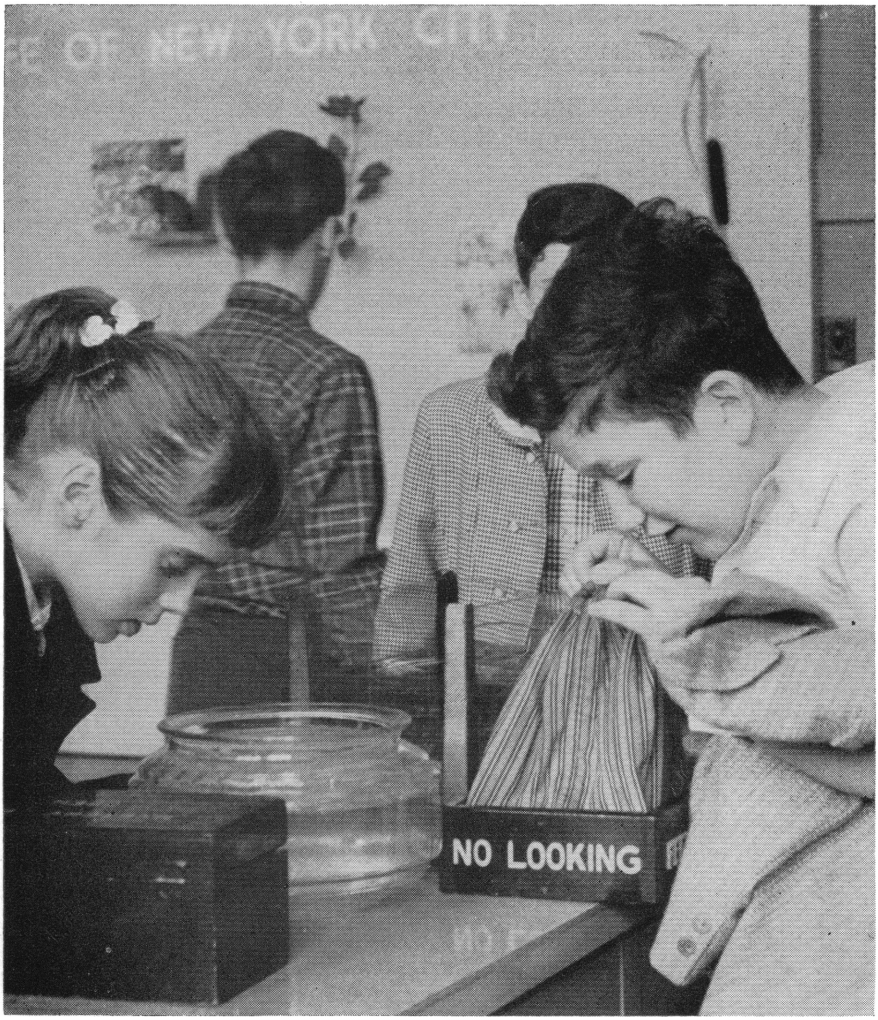
Among the new exhibits installed in the Planetarium corridors during the year were "Computers in Astronomy," prepared by the International Business Machines Corporation, and "You in the Space Age," prepared by the Republic Aviation Corporation. A "Moon Probe" exhibit, furnished by the United States Army, was also displayed temporarily during the spring.

Attendance for the twelve-month period was 615,520, representing a decrease of 2428 from the figure for the previous fiscal year. This reversal of the trend of the past four years, during which attendance has increased progressively, may be attributed to the absence of parking facilities for nearly half of the period under consideration. The parking lot adjoining the Planetarium was deemed unsafe for use in January and has been closed since that time.

DEPARTMENT OF PUBLIC INSTRUCTION

Several new and widely differing programs were added during the year to the already broad list of educational services performed by the Department of Public Instruction, reports Mr. John R. Saunders, Chairman. In addition, regular programs in almost every case reached a considerably larger public than did those in the previous year. In all, the estimated grand total of contacts numbered 16,943,682.

These services, both formal and recreational, are offered to pre-school and school children, teachers and teachers-in-training, older people, laymen whose hobbies lie in the field of the natural sciences, college students, nurses, Boy Scouts, Campfire Girls,



An excess of zeal sometimes tempts a visitor to the Natural Science Center to steal a peak into the "no looking" box instead of trying to guess, by feel, whether the box holds a leaf, shell or cocoon. But whether or not he reads each label or tries to solve every brain-teaser, or just comes to look at the live animals, he will leave with a greater knowledge of nature around New York.

special groups of handicapped people, and many others. Activities vary from college-accredited courses to film programs, bird walks, trailside exhibits, and services for institutionalized children and adults. Plans have been completed for a new adult evening school; the first Summer Institute for Biology Teachers is being conducted by the department; and a field trip to Mexico and Central America is being offered.

The range of undertakings of the department is made possible by the cooperation of the City of New York and by grants from private donors and such organizations as the National Science Foundation and the New York Fund.

The basic service of the department, in which all members participate, is the "World We Live In" program which provides instruction at the Museum to classes of school children from grades three to nine coordinated with their school curriculum. Last year, under the supervision of Miss Marguerite R. Ross, fourteen separate themes were presented to 1843 classes. A special version of the program was presented to 619 handicapped or intellectually gifted children. In addition, Museum instructors visited 747 children at eight different hospitals and shelters, a new enterprise that will be continued in the coming year in cooperation with the Board of Education.

In February, the Peter Van Gerbig Natural Science Center for Young People welcomed its 150,000th visitor since its opening in November, 1954. The Center, which is under the direction of Miss Lois Hussey, Assistant Chairman of the department, presents colorful exhibits, live animals, and nature projects which children may enjoy in their leisure hours. In addition, 225 class groups received formal instruction at the Center.

The High School Science Programs, also directed by Miss Hussey, were expanded to accommodate 1565 students from 45 schools. Each program—one on "Prehistoric Life" and one on "Animal Behavior"—presents each group with two hours of instruction and discussion illustrated by visits to Museum

exhibitions and research laboratories. The department wishes to acknowledge the cooperation of Dr. Lester R. Aronson, Chairman of the Department of Animal Behavior, and of the late Dr. Myron Gordon.

A course in introductory mineralogy has been made possible for four consecutive years by the generosity of an anonymous donor. To date, 79 selected high school students have completed the course. A questionnaire, which was filled out by 34 of these students, revealed that 24 were majoring in science, of whom seven had chosen geology as their career. All 24 asserted that the department course had influenced their choice. These results are especially gratifying, as it was the donor's stated purpose to interest promising students in science careers, particularly in geology.

In the belief that adult education is as vital a concern of the Museum as educational programs for children, the department has, either in operation or scheduled for the near future, twelve separate adult programs, under the direction of Mr. C. Bruce Hunter. Of the five that are new, three are being aided by special grants.

A grant from the National Science Foundation has made possible a Summer Institute for Biology Teachers to be conducted by Museum teachers at the Archbold Biological Station at Lake Placid, Florida, during July and August, 1959. This is the first program of its kind given by this Museum, or, it is believed, by any museum.

The New York Fund has allotted money for the establishment at the Museum of an evening school for adults to begin in the fall of 1959. Eight different courses are scheduled and will include the participation of guest authorities. The program is expected to be self-sustaining by the second year.

A contribution from Mrs. Lewis S. Thompson has made possible an experimental project of nature trails and exhibits to be established at a number of New Jersey mental and penal institutions as part of their rehabilitation programs.

Under a new "Museum Aides" program, set up in cooperation with the School of Education of the City College of New York, the department is training new and prospective teachers in the best use of Museum resources. During the year, six City College students observed and assisted with departmental activities. Additional teacher-training in the use of museums was provided by Mr. Saunders who, in cooperation with representatives of the other major museums in the city, participated in a special workshop for a selected group of city school teachers.

The regular program of afternoon adult courses, which offers in-service credit to city teachers and is also open to interested laymen, was presented to a capacity number of 869 persons—an increase of 439 over the preceding year. Several hundred additional applicants had to be turned away.

Other departmental activities included the Nurses' Education Program; two courses by Miss Farida A. Wiley, "Natural Science for the Layman," in which 1628 participated, and a course for nature counselors and youth leaders; Planetarium and film showings for 3344 Adult Students' Council members; the free Wednesday and Saturday film programs; and an advisory service for the Vacation Camp for the Blind, following completion by members of the department of nature trails and a nature museum at the camp.

Under the care of Mr. Carlton B. Beil, 9317 circulating exhibits were lent to 508 schools and other educational institutions in the city.

On July 1, 1959, the administrative supervision of the Slide and Filmstrip Library, Film Library, and Photographic Division, through which thousands of organizations and individuals are provided with visual material for reproduction or teaching aids, was assigned to Mr. Saunders. Two filmstrips, "The Trees in Our Streets," and "Exploring New York City for Birds," were produced under the direction of Miss Dorothy A. Fulton, Manager of the Slide and Filmstrip Library, and Mrs. Elizabeth

Guthrie, in cooperation with Mr. Peter Greenleaf of the Board of Education. Funds for the initiation of the project were generously contributed by Mr. Henry Guthrie. Seven hundred copies of each have already been purchased for use in the city schools, and other strips are in process of being developed with the assistance of members of the department.

Field study and collecting trips were made by department members, in several cases on their own time and at their own expense, from which the department has benefited substantially. Areas visited included the southern and southwestern United States, the Canadian Arctic, Mexico, Puerto Rico, and Nova Scotia.

FIELD STATIONS

Archbold Biological Station

Researches carried on at the Archbold Biological Station at Lake Placid, Florida, included the continuation of a number of studies reported in the *Annual Reports* for previous years. Notable among these was the parasitological work of Dr. Lawrence R. Penner, University of Connecticut, for the third successive year. Again, the main emphasis in these investigations was on the biological aspect of avian schistosomiasis, with attention also being devoted to the marking and growth studies of parasitized and non-parasitized mollusks. Dr. Neal A. Weber, Swarthmore College, continued his investigations of fungus-growing ants and their fungi. Mr. Richard Archbold again observed and collected trap nests for solitary, wood-nesting wasps on behalf of research being conducted by Dr. Karl V. Krombein of the United States National Museum.

Interesting and productive results were achieved in a project undertaken by Dr. Stuart Ward Frost, Pennsylvania State University, in the light trapping of insects. Dr. Frost's purpose was to determine whether or not it is practicable to operate light traps during the winter in a semitropical area such as

Florida, as well as to establish the periods of night at which various insects are most active.

Preliminary work was done by Dr. Jane Brower, Mt. Holyoke College, and Dr. Lincoln Brower, Amherst College, for a proposed program to be conducted at the Station during the next three summers. Their studies will concern the role of courtship in the mimicry of butterflies, the effect of different relative frequencies of models and mimics on mimicry, and laboratory analysis of the selective basis for the origin of mimetic color patterns.

The Sixth Archbold Expedition to New Guinea is currently in the field, as is mentioned in the report of the Department of Mammals.

Kalbfleisch Field Station

The newest field station of the Museum, a 94-acre estate near Huntington, Long Island, became the operating base for a number of research projects during the year. The estate had been maintained as a wildlife sanctuary since it was bequeathed to the Museum by Miss Augusta S. Kalbfleisch. This station, which is being utilized by scientists of the Museum and other nearby institutions, offers a unique environment in that it constitutes a natural field laboratory within commuting distance of New York.

Dr. Wesley E. Lanyon of the Department of Birds was appointed Director of the station and took up residence in September. A Committee on Research was appointed to assist Dr. Lanyon in coordinating a program for utilization of the station's resources.

Dr. Lanyon reports that the station has been completely fenced to provide adequate security and privacy for research investigators. Comfortable housing accommodations have been prepared and ample space is available for laboratories and animal quarters.

Comprehensive surveys of the flora and fauna were initiated

as a basis for future research. A map and accompanying descriptive text of the types of vegetation cover were prepared to provide a general account of the composition and history of the various habitats represented. These include an oak woodland, weed fields, wooded fence rows, a small pond, and conifer plantations. Surveys of the amphibians, reptiles, and mammals were inaugurated. A complete census of the breeding birds was made, and a banding program has already provided data on the wintering populations of birds.

A long-term ecological study of the relationship between successional changes in certain plant communities and the animals that inhabit them has been undertaken by five Museum departments. The Department of Public Instruction began conducting field trips to the station as part of its program "Natural Science for the Layman."

A significant use of the station was effected in the launching of projects by the Departments of Astronomy and Mammals as part of the Undergraduate Training Program of the National Science Foundation. In this connection a college student, working with Dr. Kenneth L. Franklin, Associate Astronomer, took up residence at the station to assist Dr. Franklin in his study of radiation from Jupiter. Dr. Richard G. Van Gelder, Acting Chairman of the Department of Mammals, with the assistance of three college students, began a long-term study of small mammal population fluctuations. A seminar for the participants in the National Science Foundation program is scheduled to be held at the Kalbfleisch Field Station in August, 1959.

Lerner Marine Laboratory

The Lerner Marine Laboratory at Bimini, Bahamas, reported a successful year both in research activities and in the improvement and extension of facilities. On December 1, 1958, Dr. Henry Kritzler was appointed Resident Naturalist at the Laboratory, and work was begun on two interesting long-range

investigations, initiated by Dr. Kritzler with support from the Office of Naval Research. The first, on under-water sound of biological origin, involves the collaborative efforts of several leaders in this field of research. The second, on the behavior and orientation of sharks under field conditions, required the construction of a series of large shark pens adjacent to the exhibition dock.

Among the diverse projects carried on at the Laboratory by visiting scientists were comparative studies of the physico-chemical properties of muscle tissue by Dr. Richard J. Frederick of the University of Michigan; studies in calcareous sediments by Messrs. Edwin D. McKee and Curt Teichert of the United States Geological Survey; and a study of mother-embryo relationships in rays and skates by Dr. Perry W. Gilbert of Cornell University. Dr. Werner Bergmann of Yale University collected and processed invertebrate material to be used in a cancer chemotherapy program. Continued studies by the Retina Foundation involved the collection of vitreous and aqueous humors from tuna.

Preparations were begun for the construction of a new air-conditioned wing on the Laboratory to house both a more extensive library and a room for instruments subject to damage by humidity and salt spray. The nucleus for the library was created with the purchase of complete sets of *Chemical Abstracts* and *Biological Abstracts*. Extension of Laboratory facilities also included the acquisition of a collecting vessel, the "Sea Horse," and a live-well barge, the "Sea Cow," both gifts from the Miami Seaquarium.

Southwestern Research Station

Dr. Mont A. Cazier, Director of the Southwestern Research Station, reports that during its fourth year the Station welcomed 106 scientists and specialists who worked in 20 different fields of endeavor including botany, ecology, bacteriology, forestry, entomology, mammalogy, wildlife management, geology

and paleontology, ornithology, herpetology, genetics, and animal behavior. The average number of days spent at the Station by each researcher increased from 17 to 34. In general, Dr. Cazier noted, researchers are devoting less time than formerly to collecting and more time to studying the animals and plants in their natural environment. The visitors represented 25 organizations in 14 states and four foreign countries. The percentage of projects being conducted at the Station under the sponsorship of various foundations and fellowships showed a marked increase and would seem to attest to both the significance of the problems and the effectiveness of the location and facilities of the Station. During the year, eight scientific papers were published concerning work done entirely or primarily at the Station.

Twelve classes totaling 172 students were accommodated. They came from the University of Arizona, the University of Oklahoma, Colorado College, the University of California, New Mexico State University, and two Arizona high schools.

Through the generosity of Dr. Lansdell K. Christie and Mr. Herbert Schwarz, a constant temperature room and walk-in freezer will be installed in the laboratory. These are necessary items for many experiments and the Station has been handicapped without them.

DEPARTMENT OF EXHIBITION AND CONSTRUCTION

Mr. Gordon R. Reekie, General Manager of Exhibition and Construction, reports continuing progress on a number of exhibition programs, including the Hall of the Biology of Man, the Giant Sloth Hall, and the Corridor of the Hall of North American Mammals.

The center section of the Hall of the Biology of Man is near completion and models for the two other sections are now in preparation.

Ten cases in the Giant Sloth Hall were completed and will be opened to the public when the exhibits in the surrounding

area have finished. One exhibit entitled "New Discovery," which was completed and opened to the public, traces a search for fossils from the field to the Museum and will be changed from time to time as important new finds in paleontology are made.

Of the fourteen mammal groups to be installed in the west Corridor of the Hall of North American Mammals two are now completed and ready for final installation. These are the woodchuck, collected in New York State, and the mink, collected in the New Jersey pine barrens. Other groups that have been collected include the otter, from Algonquin Park, Ontario, Canada; the weasel, from Mt. Katahdin, Maine; the kit fox and kangaroo rat, from Death Valley, California; the armadillo, from Santa Ana Reservation near Brownsville, Texas; the peccary, from Big Bend National Park in Texas; and the black-footed ferret or prairie dog, from Wind Cave National Park, Hot Springs, South Dakota.

The exhibit "Eggs, Incubation, Care of Young," was completed and opened in the Sanford Memorial Hall of Bird Biology. The two remaining alcoves for this hall, which are now being built, are "Courtship in Birds" and "Birds and Their Environment." An additional project in cooperation with the Department of Birds has been the development of a Japanese habitat group representing a site near Mt. Fuji. This exhibit will fill a serious gap in the Hall of the Birds of the World.

The Hall of Oil Geology was renovated and the statistics relating to oil production, economics, and new petroleum sources were brought up to date. A new lighting system was also installed.

The special exhibition program was highlighted by the exhibition entitled "Shrimps, Lobsters and Crabs: Much Ado About Decapod Crustaceans," which was opened to the public in March.

In October an exhibition entitled "Theodore Roosevelt Park" was installed in the center of the first floor of the Roosevelt

An extensive collection of Rumanian folk art was shown in a special temporary exhibition which included this model room. The materials were borrowed from museums in Rumania in exchange for an American exhibition sent there the previous year under the East-West Cultural Exchange Program of the United States Department of State.

Memorial. Through photographs, maps, and labels this exhibition traced the history of Manhattan Square from 1807 to 1958 when it was renamed Theodore Roosevelt Park.

A small but timely exhibit, "The Roof of the World," was opened in April in the north end of Roosevelt Memorial Hall. This exhibit, containing Tibetan masks, banners, costumes, and photographs, served to direct the visitor's attention to the Museum's fine collection of Tibetan material on permanent display elsewhere in the building, at a time when the news was focused on Tibet and the escape of the Dalai Lama.

"Folk Art in Rumania," an extensive exhibition sponsored by the United States Department of State and the Legation of the Rumanian People's Republic, was opened to the public in May in the First Floor Annex. The exhibition was designed by the Museum staff and financed by the Rumanian People's Republic.

The Corner Gallery schedule included two special exhibitions. A significant new collection of little-known wood sculpture from New Guinea was strikingly displayed under the title "The Art of the Asmat." In "Quest for the Divine Mushroom, an Ancient Rite Rediscovered," color photographs, sound recordings, mushroom stones, and text were used to illustrate a discovery made by Mr. R. Gordon Wasson and photographed by Mr. Allan Richardson. "A Child's World of Nature," consisting of black and white photographs by Mrs. Arline Strong; "Sea Peoples of the Archipelago," paintings by Mrs. Lucie Palmer; and "Wild Flowers of Switzerland," a display of water colors by the Swiss illustrator, Mrs. Pia Roshardt, completed the Corner Gallery calendar.

Mr. Lothar P. Witteborg, Chief of the Exhibition Department, by request of the Government of India, spent six months in India as consultant in connection with the new National Museum in New Delhi. The consultation grant was under the auspices of the Office of International Education Exchange Service of the Department of State. While in India, Mr.

Witteborg visited twenty-four regional and state museums located throughout the vast subcontinent.

Dr. George H. Childs retired during the year after thirty-five years of distinguished service to the Museum. Dr. Childs was especially noted for his remarkable talent in creating uniquely intricate models which may be seen in many of the exhibition halls, including the Gallery of Invertebrates, the Warburg Hall, the Hall of North American Forests, and the Hall of the Biology of Man now in preparation.

SCIENTIFIC PUBLICATIONS

Miss Ruth Tyler, Editor of Scientific Publications, reports the production of 62 numbers of *American Museum Novitates,* with a total of 1228 pages, two parts of *Anthropological Papers of the American Museum of Natural History,* totaling 448 pages, and eleven articles in the *Bulletin of the American Museum of Natural History,* totaling 1026 printed pages, as well as the *James Arthur Lecture on the Evolution of the Human Brain,* for 1958, 32 pages.

NATURAL HISTORY MAGAZINE

An outstanding event of the year, reports *Natural History* Editor John Purcell, was the publication of a 36-page pictorial history of the Museum which appeared in the April issue of the magazine to coincide with the ninetieth anniversary of the Museum.

Issues continue to run larger than the previously standard 56 pages, and magazines of 64 pages are becoming the rule. Another new feature, which appeared in five of the year's ten issues, is the use of a four-color plate to illustrate an important article. The Christmas issue included a festive, four-page color insert, with lavish gilt touches, on "The Animal Lore of the Past," using illustrations from medieval bestiaries. The article was used as a separate Christmas mailing piece sent to publicity outlets and was widely seen and enthusiastically received.

Members of the scientific staff of the Museum continue to contribute original articles and book reviews, thereby substantially aiding the magazine in its essential purpose—that of being a meeting place for the professional scientist and the interested layman.

Paid circulation for the year reached 85,920 (through May, 1959), as compared to 79,832 in the previous year. A portion of the increase is attributable to the more than 1500 former subscribers to the *Sky Reporter,* incorporated into *Natural History* in June, 1958, who have become regular *Natural History* subscribers.

THE JUNIOR NATURAL HISTORY MAGAZINE

The Editor of *The Junior Natural History Magazine,* Mrs. Marion B. Carr, reports that circulation continued to increase during the past year, reaching a total of 99,898. The magazine has proved its importance to the schools in its program of close cooperation with school planners of curricula on social studies. New contacts with information bureaus of other nations have stimulated foreign circulation, and the publication has helped foreign schools in the presentation of nature subjects.

CURATOR

The new quarterly publication of the Museum, *Curator,* has reached a circulation of 752 institutional and individual subscribers, including museums and libraries in all 50 states of the nation and in twenty-seven foreign countries on six continents. *Curator* continues to publish articles about exhibition, preparation techniques, publication, research, professional standards, administration, teaching, and many other aspects of museum work.

The widespread distribution of the magazine and the comments of the readers indicate that the problems discussed in this publication are common to museologists in many parts of the world and that *Curator* is filling a long-standing need.

MAN AND NATURE PUBLICATIONS

The Editor of *Man and Nature* publications, Dr. William A. Burns, reports that a closer liaison has been achieved between the Museum and outside publishers and that several contracts financially favorable to the Museum have been accomplished during the year.

The new *General Guide* is now available at a lower price, owing to savings in production, and its sale has shown a marked increase during the year. Handbooks about recently completed exhibition halls are in preparation.

MEMBERSHIP

Membership in the American Museum increased by 5798 new members, according to Dr. William A. Burns, Membership Secretary. A grand total of 83,523 members was recorded in all classes. Junior Membership increased from 4602 to 5384.

ATTENDANCE

During the fiscal year here reported on, 1,845,506 people visited the Museum, and 615,520 visited the Planetarium, making a combined total of 2,461,026. This figure represents an increase of 80,389 over the combined attendance for the previous fiscal year.

PICTURE CREDITS

Page 8 — *The New York Times*
Page 13 — Colonel R. B. White
Page 29 — Morris Warman, *New York Herald Tribune*
Page 31 — Lee Boltin
Page 43 — *The New York Times*
Page 45 — Jennifer Chatfield

All other photographs are by the American Museum of Natural History.

THE AMERICAN MUSEUM OF NATURAL HISTORY

Financial Statements

For the fiscal years ended June 30, 1959 and 1958

BALANCE

June 30

ASSETS:	1959	1958
Current funds:		
General funds:		
Cash	$ 45,414	$ 35,122
Accounts receivable	261,472	248,297
Inventories, principally publications	104,012	88,260
Prepaid expenses and deferred charges	87,604	85,114
	$ 498,502	$ 456,793
Special funds:		
Cash	$ 696,749	$ 567,974
Investments (market June 30, 1959, $810,300) (Note 1):		
U. S. Government bonds	861,977	750,000
Preferred stock	2,387	
Accounts receivable	14,369	7,650
Due from general funds		66,372
	$ 1,575,482	$ 1,391,996
	$ 2,073,984	$ 1,848,789
Endowment funds:		
Cash:		
Demand deposit	$ 278,916	$ 85,112
Time deposit		300,000
Investments (market June 30, 1959, $32,839,000) (Notes 1 and 2):		
Bonds	12,681,233	13,630,042
Preferred stocks	2,059,493	2,284,935
Common stocks	10,814,763	7,219,655
Other	4,095	4,299
	$25,838,500	$23,524,043
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	$ 127,408	$ 48,859
Investments, at cost (market June 30, 1959, $6,472,000):		
Bonds	4,566,117	4,359,845
Preferred stocks	699,871	850,221
Common stocks	985,673	640,920
Loan receivable	30	270
	$ 6,379,099	$ 5,900,115
	$34,716,583	$31,697,947

The accompanying notes are an integral part of these statements.

OF NATURAL HISTORY

SHEETS

1959 and 1958

FUNDS and LIABILITIES:	*1959*	*1958*
Current funds:		
General funds:		
Accounts payable, payroll taxes withheld, etc.	$ 83,242	$ 63,886
Deferred income, principally unearned subscriptions	409,012	386,528
Due to special funds		66,372
Appropriations for outstanding commitments	30,877	30,613
	523,131	547,399
Deficit	24,629	90,606
	$ 498,502	$ 456,793
Special funds:		
Balances of funds received or appropriated for specific purposes	$ 1,575,482	$ 1,391,996
	$ 2,073,984	$ 1,848,789
Endowment funds:		
Endowment funds, income available for:		
Restricted purposes	$11,585,097	$10,933,826
Unrestricted purposes	6,514,303	6,147,163
Funds functioning as endowment, principal and income available for:		
Restricted purposes	870,393	619,203
Unrestricted purposes (Notes 2 and 5)	6,868,707	5,823,851
	$25,838,500	$23,524,043
Funds invested in bonds of The American Museum of Natural History Planetarium Authority	$ 425,000	$ 425,000
Pension funds:		
Pension fund balance	$ 6,376,972	$ 5,898,988
Welfare fund balance	2,127	1,127
	$ 6,379,099	$ 5,900,115
	$34,716,583	$31,697,947

GENERAL FUNDS

SUMMARY STATEMENTS OF CHANGES

for the fiscal years ended June 30, 1959 and 1958

	1959	*1958*
Deficit, beginning of year	$ 90,606	$ 48,804
Less, Transfer from unrestricted funds functioning as endowment	90,606	48,804
	—	—
Income:		
Appropriation from the City of New York	$1,432,792	$1,360,154
Endowment funds	1,016,457	995,608
Outside trusts and foundations	60,866	65,156
Gifts and grants	205,589	176,708
Other (Notes 2, 3 and 4)	391,611	326,081
	$3,107,315	$2,923,707
Expenses and appropriations:		
General administration	$ 513,850	$ 503,787
Educational activities	1,244,045	1,235,133
Pension and other social benefits	245,951	225,814
Operation and maintenance of physical plant	1,127,834	1,058,057
Appropriations transferred to special funds		7,000
Appropriation for outstanding commitments at end of year	30,877	30,613
	3,162,557	3,060,404
Less, Appropriation for outstanding commitments at beginning of year	30,613	46,091
	$3,131,944	$3,014,313
Deficit, end of year	$ 24,629	$ 90,606

The accompanying notes are an integral part of these statements.

SPECIAL FUNDS

SUMMARY STATEMENTS OF CHANGES IN FUND BALANCES

for the fiscal years ended June 30, 1959 and 1958

	1959	*1958*
Balance, beginning of year	$1,391,996	$1,388,816
Income:		
Endowment funds	$ 130,244	$ 121,407
Gifts and grants	681,127	463,753
Other	288,974	149,134
Transfers from general funds		7,000
	$1,100,345	$ 741,294
Expenditures for the special purposes and objects for which the funds were established	$ 901,859	$ 728,114
Transfer to endowment funds	15,000	10,000
	$ 916,859	$ 738,114
Balance, end of year	$1,575,482	$1,391,996

The accompanying notes are an integral part of these statements.

ENDOWMENT FUNDS

SUMMARY STATEMENTS OF CHANGES IN PRINCIPAL

for the fiscal years ended June 30, 1959 and 1958

	1959	*1958*
Balance, beginning of year	$23,524,043	$21,820,135
Additions:		
Gifts, bequests, etc. (Note 2)	$ 1,074,929	$ 771,572
Net profit on sales of investments	1,343,460	985,411
Transfer from special funds	15,000	10,000
	$ 2,433,389	$ 1,766,983
Deductions:		
Expenditures, for custodian fee	$ 5,000	$ 5,000
Transfers to general funds:		
For payment of certain expenses	20,300	3,425
To dispose of operating deficit of preceding year	90,606	48,804
Transfers to pension fund	3,026	5,846
	$ 118,932	$ 63,075
Net additions	$ 2,314,457	$ 1,703,908
Balance, end of year	$25,838,500	$23,524,043

The accompanying notes are an integral part of these statements.

PENSION FUNDS

SUMMARY STATEMENTS OF CHANGES IN PRINCIPAL

for the fiscal years ended June 30, 1959 and 1958

	1959	*1958*
Balance, beginning of year	$5,900,115	$5,578,846
Additions:		
Contributions of members	$ 140,830	$ 130,568
Contributions of Museum	170,749	161,265
Contribution to welfare fund	1,000	
Income from investments	245,505	232,060
Net profit on sales of investments	149,853	14,046
	$ 707,937	$ 537,939
Deductions:		
Payments to members and beneficiaries	$ 224,250	$ 212,217
Expenses	4,703	4,453
	$ 228,953	$ 216,670
Net additions	$ 478,984	$ 321,269
Balance, end of year	$6,379,099	$5,900,115

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 fiscal years ended in 1959 and 1958 royalties received, net of expenses, amounted to $58,258 and $112,209, respectively, of which $50,000 was credited to general funds (other income) in each year.

3. The Planetarium Authority is operated under the supervision of the Museum's management. Its financial statements and the auditors' opinion with respect thereto are annexed. Interest income received from the Planetarium amounted to $25,650 in each of the fiscal years ended in 1959 and 1958. These amounts are included in other income of the general funds.

4. Other income of the general funds for the fiscal years ended in 1959 and 1958 include (a) net income from magazine and book shop operations of $46,367 and $30,989, respectively, and (b) transfers from unrestricted funds functioning as endowment of $20,300 and $3,425, respectively. Gross income from magazine and book shop operations amounted to $837,138 and $761,046 for the respective years.

5. Unrestricted funds in the amount of $250,000 have been committed in connection with alterations to the existing electrical system and an additional amount of $132,100 has been appropriated as the Museum's share for the modernization of the auditorium. Since June 30, 1959, $110,000 and $85,000, respectively, has been paid in connection with such commitments.

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, 1959 and the related statements of funds for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We made a similar examination for the fiscal year ended June 30, 1958.

In our opinion, the accompanying balance sheets and related statements of funds present fairly the financial position of the Museum at June 30, 1959 and 1958 and the results of its operations for the fiscal years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery

New York, August 10, 1959.

THE AMERICAN MUSEUM OF NATURAL HISTORY
PLANETARIUM AUTHORITY

Financial Statements

For the fiscal years ended June 30, 1959 and 1958

THE AMERICAN MUSEUM

PLANETARIUM

BALANCE SHEETS,

ASSETS:	*1959*	*1958*
Cash	$ 82,235	$ 58,549
Accounts receivable	1,318	1,415
Inventory of publications	21,381	18,023
	$104,934	$ 77,987
Equipment, fixtures, etc. (Note 1):		
Furniture and fixtures	$ 38,870	$ 38,870
Plant equipment, machinery and tools	70,222	70,222
Zeiss planetarium instrument	126,434	126,434
Deposit on new Zeiss planetarium instrument (Note 2)	50,917	
Copernican planetarium instrument	30,435	30,435
	316,878	265,961
Less, Allowances for depreciation	259,651	256,498
	57,227	9,463
Building, at cost (Note 1)	569,209	569,209
Land (donated by the City of New York)	—	—
	$626,436	$578,672
Prepaid insurance	$ 2,167	$ 3,215
	$733,537	$659,874

OF NATURAL HISTORY

AUTHORITY

June 30, 1959 and 1958

LIABILITIES:	*1959*	*1958*
Accounts payable	$ 12	$ 23
4½% Refunding Serial Revenue bonds, and interest thereon (Note 3):		
Interest:		
Unpaid coupons, past due	$259,830	$258,525
Accrued on bonds not yet due		218
Accrued on past-due unpaid bonds	244,620	220,057
	504,450	478,800
Less, Payments on account, including $25,650 in each of the respective years	189,000	163,350
	$315,450	$315,450
Principal:		
Past due	$570,000	$541,000
Due in annual instalments of $29,000 each through May 1, 1959		29,000
	$570,000	$570,000
	$885,462	$885,473

CONTRIBUTED CAPITAL AND DEFICIT:

Contributed capital:		
Charles Hayden	$156,869	$156,869
Charles Hayden Foundation (Note 2)	180,925	130,925
	337,794	287,794
Deficit, as annexed	489,719	513,393
	$151,925*	$225,599*
	$733,537	$659,874

* Denotes deduction.

The accompanying notes are an integral part of these statements.

STATEMENTS OF INCOME, EXPENSES AND DEFICIT

for the fiscal years ended June 30, 1959 and 1958

	1959	*1958*
Income:		
Admission fees less allowances and commissions	$340,151	$322,820
Special lectures and courses	14,131	17,517
Miscellaneous	2,972	720
	$357,254	$341,057
Auxiliary activities:		
Sales booth	$ 78,389	$ 85,041
Sky Reporter pamphlet		6,947
	$ 78,389	$ 91,988
Total	$435,643	$433,045
Expenses:		
Preparation, presentation and promotional:		
Salaries	$125,274	$118,063
Supplies and expenses	32,260	28,206
	$157,534	$146,269
Operation and maintenance:		
Salaries	$ 71,379	$ 65,719
Supplies and expenses	42,302	45,009
Special improvements, renovations, etc.	18,885	17,062
	$132,566	$127,790
Administrative and general:		
Salaries	$ 7,500	$ 5,000
Pension fund, social security and other employee benefits	15,369	14,181
Miscellaneous	10,783	9,120
	$ 33,652	$ 28,301
Auxiliary activities:		
Sales booth	$ 59,414	$ 63,928
Sky Reporter pamphlet		6,253
	$ 59,414	$ 70,181
Total	$383,166	$372,541
Income before interest and depreciation	$ 52,477	$ 60,504
Interest on 4½% Refunding Serial Revenue bonds, including $24,562 and $23,257 on past-due bonds for the respective years	$ 25,650	$ 25,650
Provision for depreciation (Note 1)	3,153	3,153
Total interest and depreciation	$ 28,803	$ 28,803
Net income for year	$ 23,674	$ 31,701
Deficit, beginning of year	513,393	545,094
Deficit, end of year	$489,719	$513,393

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. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.

   Since the purchase in 1948 of the Planetarium Authority bonds by The American Museum of Natural History, it has been the general policy of the Authority to charge to expense purchases of plant and equipment.

2. The Planetarium Authority has contracted for the purchase of a new Zeiss planetarium instrument at a cost of $122,750, net of trade-in of the present instrument. The Charles Hayden Foundation has pledged $120,000 toward the cost of the new instrument, $50,000 of which was received during the fiscal year ended June 30, 1959.

   In addition $51,160 has been committed to provide equipment required in connection with installation of the new Zeiss instrument and to refurbish the Sky Theatre and the Copernican Room.

3. 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, 1959 and the related statement of income, expenses and deficit for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We made a similar examination for the fiscal year ended June 30, 1958.

In our opinion, the accompanying balance sheets and related statements of income, expenses and deficit present fairly the financial position of the Authority at June 30, 1959 and 1958 and the results of its operations for the fiscal years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery

New York, August 10, 1959.

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