



101st ANNUAL REPORT / 1969-70
THE AMERICAN MUSEUM OF NATURAL HISTORY



ONE-HUNDRED-AND-FIRST 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



Last year the Museum celebrated its 100th birthday, an occasion that has a meaning somewhat different in the life of a museum from that of a person. The American Museum of Natural History continues; time is hardly a factor in its existence. We live always in the present, with our eye on the future, aiming to improve the service that is rendered to people who visit the Museum. More than four million persons came here last year. Two and one-half million were children who, generation after generation, find this a place in which to experience wonder, beauty and magic that may lead them into fields of interest they might otherwise not have known.

Ideally, any child's first experience in the Museum should produce a sense of direction and a search for further knowledge in the world of the natural sciences. With its 38 exhibition halls, dramatically detailing the relevance of natural history, the Museum is a teacher that makes learning available to everyone. Special mention should be made of The American Museum-Hayden Planetarium and its staff of astronomers, who make the cold world of outer space more understandable to some 650,000 yearly visitors.

The pageant of achievement and renewal during the year is so diverse and rich it is hard to know where to begin in cataloging it. On October 1 ground was broken for the new Childs Frick Wing, which will house the extraordinary collection of paleontological material gathered by the late Mr. Frick during his lifetime. The building has been donated to the Museum and endowed through the generosity of the Frick family. When this collection of fossil mammals has been combined with our own collection, there will be no research material in this area of science that can compare with it.

On October 2 The American Museum-Hayden Planetarium, after having been closed for a month, was reopened with a completely redecorated and reequipped Sky Theater. Among the improvements was the addition of a new Zeiss VI Projector, a gift of the Charles Hayden Foundation.

The National Aeronautics and Space Administration lent an Apollo 11 moon rock, which was displayed for the first time on Sunday, November 16. On that day more than 42,000 visitors came to see it; this was the largest single daily attendance in the history of the Museum. Everyone who saw it was fascinated by the unearthly quality of this piece of the moon.

On November 23 Dr. Edwin H. Colbert, Curator of Vertebrate Paleontology, and the expedition of which he was a member in Antarctica, discovered a large number of fossil reptile and amphibian bones from the Triassic Age. Dr. Colbert identified one of the fossils as

a fragment of a *Lystrosaurus* skeleton. The discovery supports the conclusion arrived at by geophysicists that there was a supercontinent called Gondwanaland at the time *Lystrosaurus* lived. In recognizing this and other achievements of Dr. Colbert, the Museum on January 26 awarded him its gold medal for scientific achievement. He was the sixth scientist to receive such an award.

This is the greatest natural history museum in the world, and such excellence as has been achieved must be maintained and improved upon. This is expensive. Therefore, on January 8 the Museum launched the first capital campaign it ever undertook, to raise \$25 million for all the purposes that are so familiar to our friends. We have up to now succeeded in raising more than \$7 million. Nothing is more important to me than the completion of this effort, for which I will need all the support possible from the many thousands of friends of the Museum.

One of the most serious problems that confronts the Trustees is the proper and meaningful exhibition of the collections. In 1968 the firm of William F. Pedersen & Associates was employed as consulting Museum architect. With the help of our Exhibition Committee, a thorough study of the available space and the present use of this space has been made. The study has begun to indicate the directions we should take in the future planning and financing of exhibitions.

The new Hall of Mexico and Central America was opened to the public on May 16, not only with praise from anthropologists and archeologists, but also with applause from the world of art, which sees in this hall beauty that does honor to the Museum and the cultures that created the works exhibited there. The Museum has a long standing commitment to the study of man through anthropological investigations in Mexico and Central America. Today our pre-Columbian collection ranks as one of the finest in the world.

On May 6 the United States Post Office Department issued four stamps at the Museum in honor of our Centennial. Three of the stamps were based on our exhibits—the Akeley African Elephant Group, the Haida Ceremonial Canoe and the Bald Eagle Group from the Chapman Memorial Hall of North American Birds. The fourth stamp was taken from a dinosaur mural at the Peabody Museum at Yale University. The issuance ceremony was held in the Akeley Hall, and a branch of the United States Post Office was set up in the Museum for the sale of the stamps.

On July 1, 1969, Dr. Thomas D. Nicholson was appointed as Director. He has experience and knowledge of the responsibilities of the Museum as well as the competence to cope with them, having spent

fourteen years at The American Museum-Hayden Planetarium, after which he became Deputy Director of the Museum. He not only is a man of extraordinary administrative and organizational competence, but he also brings with him a sense of style and academic distinction. He succeeds Dr. James A. Oliver, who was the Director from 1959 to 1969. Dr. Oliver leaves to become Director of the New York Aquarium of the New York Zoological Society. We express gratitude to him for the creative work he did here, and wish him all success.


On September 18, the film "The Time of Man" was shown nationally on CBS-TV. This program, created by Metromedia Producers Corporation in association with the Museum, is outstanding. I am convinced that our Centennial Exhibition "Can Man Survive?" and "The Time of Man" did much to develop the national concern with the environment expressed in President Nixon's State of the Union Message in January.

We have added two more representatives of the public to the *ex-officio* list of Trustees: The Honorable Percy E. Sutton, President of the Borough of Manhattan, and the senior United States Senator from New York, the Honorable Jacob K. Javits. Seven new Trustees were elected: Mr. Howard L. Clark, Mrs. Hart Fessenden, Mrs. John V. Lindsay, Mrs. Alfred L. Loomis, Jr., Dr. Ernst Mayr, Mr. Howard J. Morgens and Mr. Alexander M. White, Jr. Four former Trustees were re-elected: Mr. Richard G. Croft, Mr. Fredrick M. Eaton, Mr. Robert G. Goelet and Mr. Robert G. Page.

Mr. Charles DeWolf Gibson and Mr. Malcolm P. Aldrich were elected Honorary Trustees at the Annual Meeting in October. Mr. James F. Oates, Jr., resigned from the Board during the year, having retired as President of the Equitable Life Assurance Society.

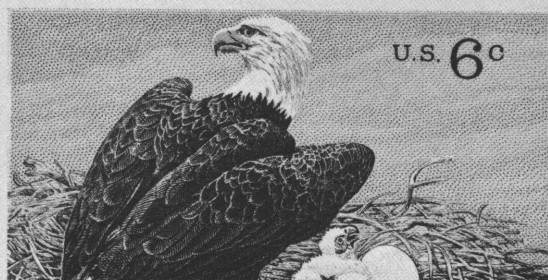
The Contributors' Program has maintained the momentum of our Centennial with another record — \$407,000 — in gifts received. The Men's Committee, chaired by Mr. David C. Clark, and the Women's Committee, chaired by Mrs. Hart Fessenden, are once again to be congratulated on a job well done.

Mrs. Fessenden, who has given generously of her energy and imagination, is stepping aside in favor of Mrs. John Macomber, with Mrs. John S. Hilson and Mrs. Robert V. Lindsay as Vice-Chairmen. Our warm thanks to Mrs. Fessenden and her Vice-Chairmen, Mrs. Charles F. Morgan and Mrs. John W. Geary, II. The leadership of the Men's Committee will remain essentially the same, with one change: Mr. Clark and Mr. Larson M. Powell will serve as Co-Chairmen, without the assistance of Mr. Thomas W. Russell, Jr., who is unable to serve again as Vice-Chairman.


President

Crowds of enthusiastic philatelists visited the Museum on May 6, the first day of issue for these four jumbo six-cent United States Postage Stamps. A ceremony in the Akeley Memorial Hall of African Mammals honored the Museum as the official sponsor of the Natural History Stamp Series.

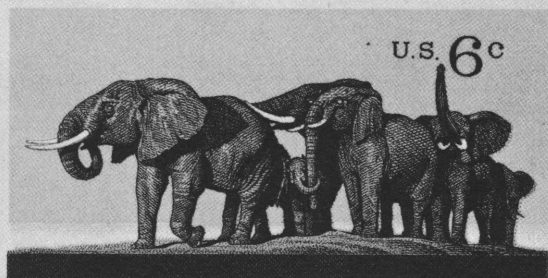
A giant crane hoists a steel girder to an interior courtyard of the Museum, where the new Childs Frick Wing is under construction. Materials are sent both overhead and through a tunnel underneath the 77th Street building, so that the historic facade will remain unchanged.



AMERICAN BALD EAGLE



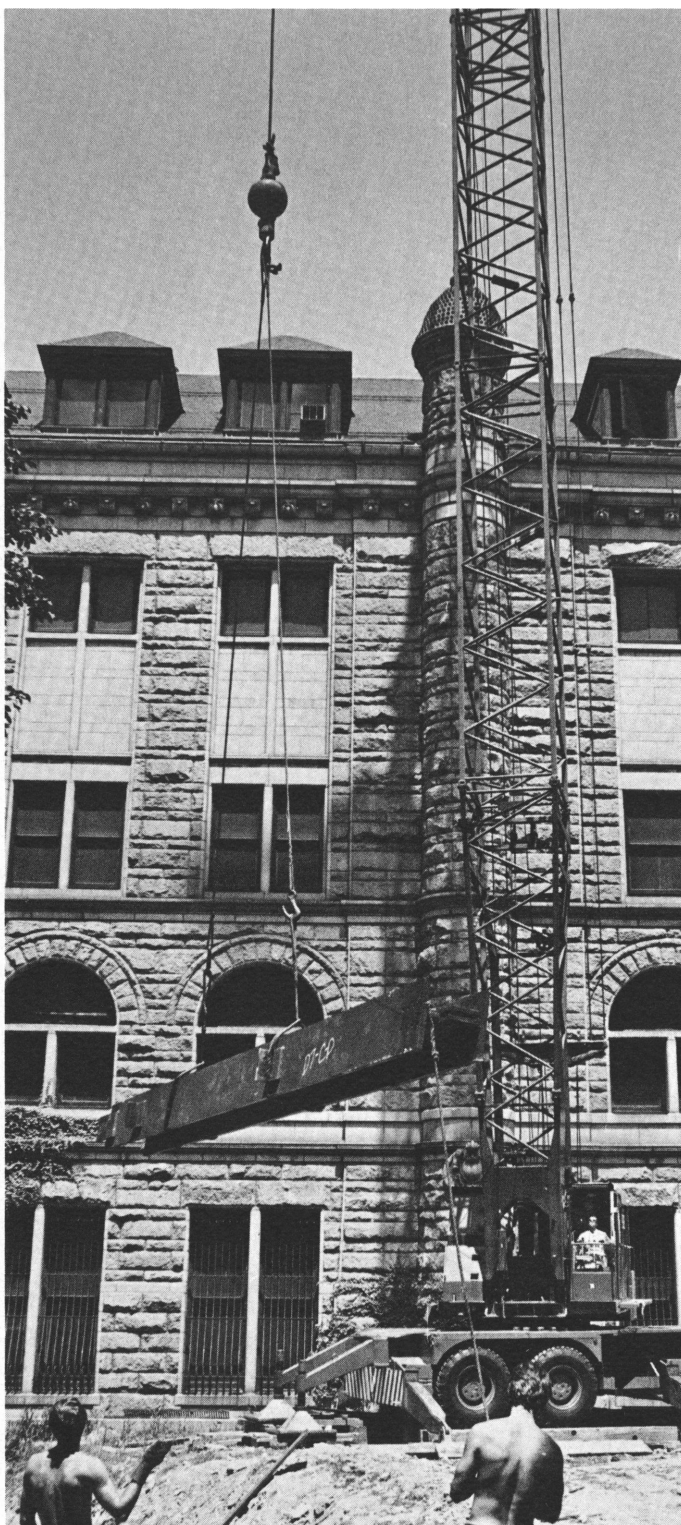
HAIDA CEREMONIAL CANOE



AFRICAN ELEPHANT HERD



THE AGE OF REPTILES



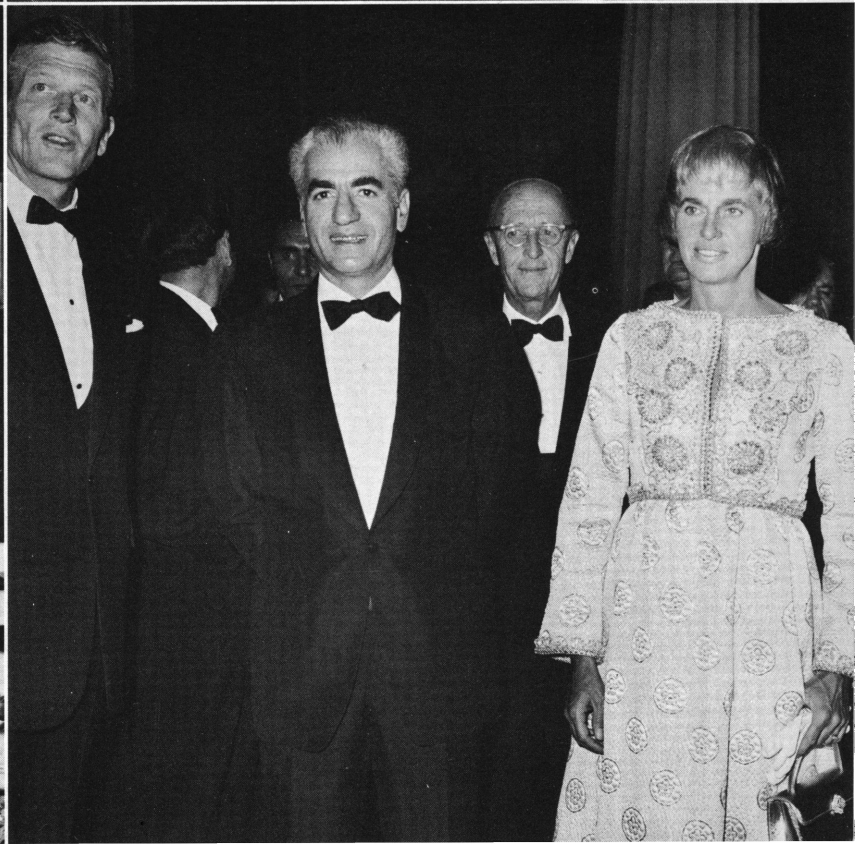
The Dan Braman, a research vessel built especially for scientific studies in the Bahamas, has been donated to the Lerner Marine Laboratory. Above, it is moored at the Laboratory's dock at Bimini. Below, a school girl appears deep in thought as she studies an exhibit in the Hall of Mexico and Central America. Two and one half million children visited the Museum throughout the year.

Some 700 people attended the dinner dance at the Museum in October, 1969, for the Greater New York Chapter of Links, Inc., a national service organization of professional women. Above, Dr. Harold C. Haizlip, Mrs. Gardner D. Stout and Mrs. Haizlip at the receiving line, with a guest. Below, volunteers on Earth Day were kept busy giving information to Museum visitors. The success of the day has inspired the development of a monthly information program on the environment.



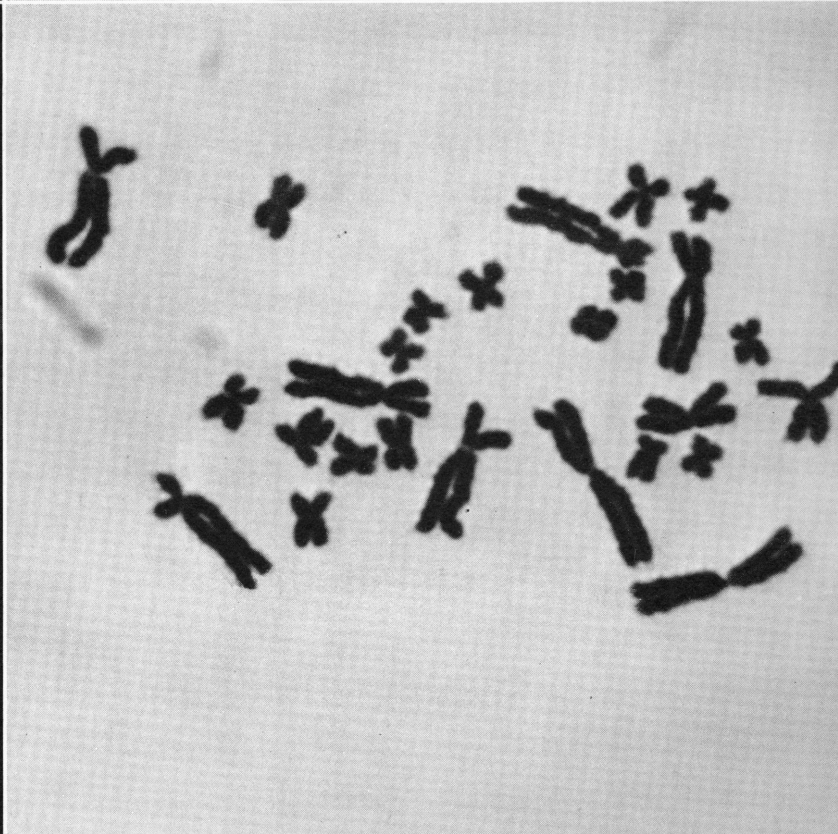
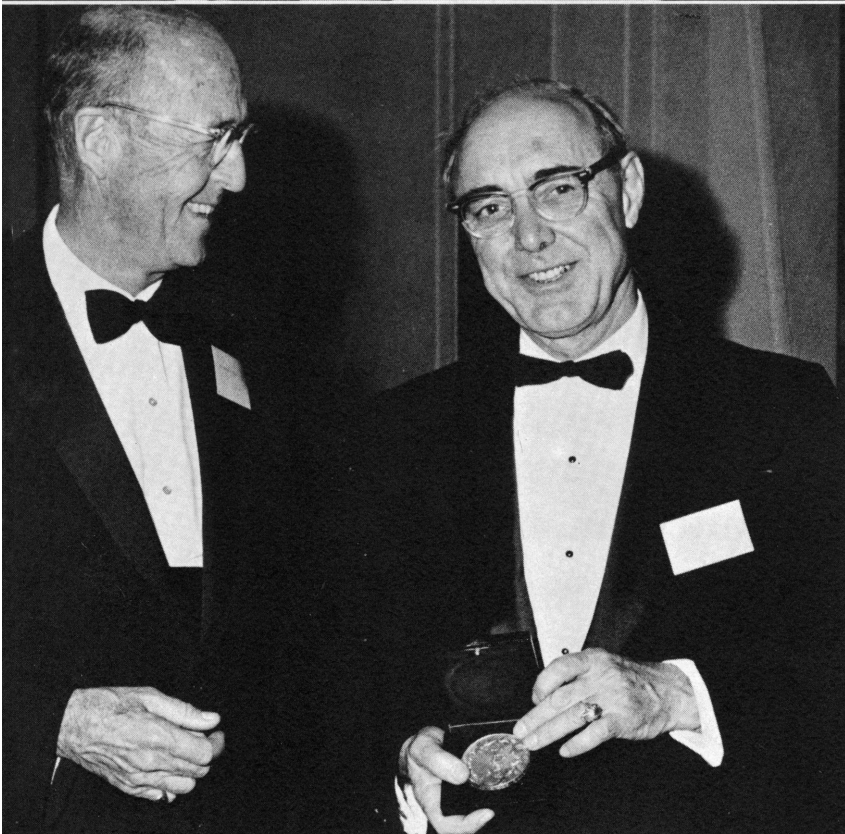
A highlight of the Centennial Year was a variety show for children that was held in the Auditorium on March 8. Above, actor Cyril Ritchard, who was master of ceremonies, congratulates a fellow actor after the show, while pleased members of the audience look on. Below, United States Senator Jacob K. Javits chats with guests at a formal dinner on May 14. The occasion was the opening of the new Hall of Mexico and Central America.

Everyone who watched—in person or on television—Macy's Annual Thanksgiving Day Parade saw the Museum's Centennial dinosaur featured as a float. Below, from left, Mayor John V. Lindsay, the Shah of Iran, Museum President Gardner D. Stout and Mrs. Lindsay are shown at a formal dinner held in the Hall of Ocean Life and Biology of Fishes. The City of New York took the occasion to officially welcome the Shah on his visit in October.



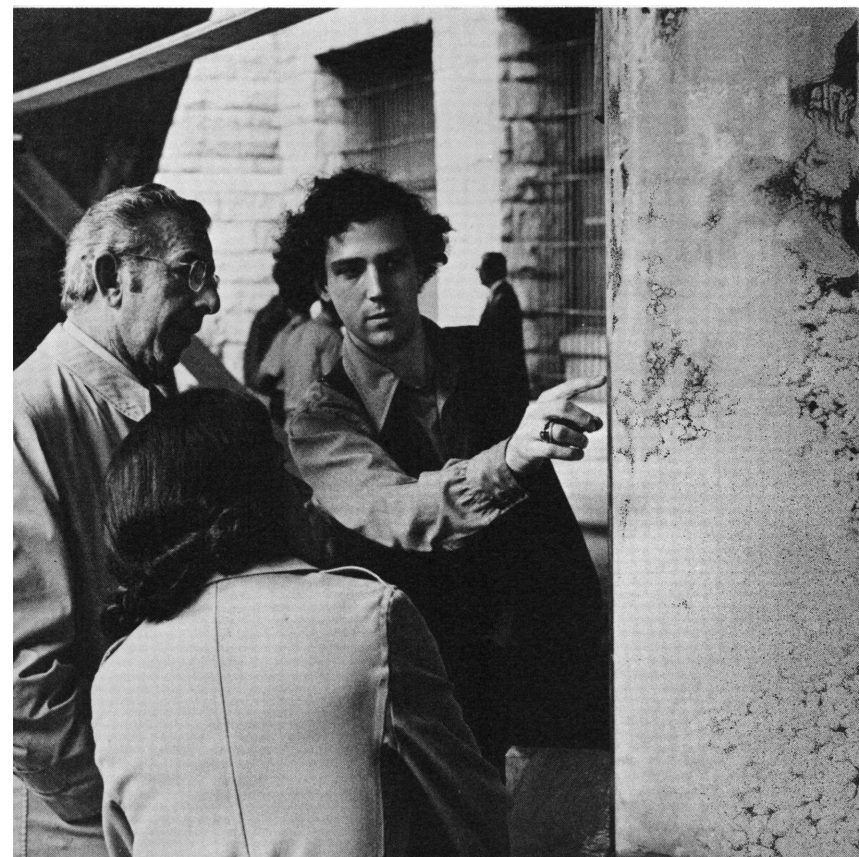
Employees who have been with the Museum for 25 years are invited to join the Quarter Century Club. Above, Mr. Ted Galusha (left), Frick Assistant Curator, accepts a certificate and congratulations from Vice-President Sidney S. Whelan, Jr. Below, Museum President Gardner D. Stout (left), chats with Dr. Edwin H. Colbert, Curator of Vertebrate Paleontology, after having presented him with The American Museum Gold Medal.

College students supported by Urban Corps funds work at the Museum in various jobs during the summer. Above, Kuen Tsang of New York Community College, who was assigned to the Division of Photography, develops a print. Below, a microscope slide displays the 26 chromosomes of the frog, *Cophixalus riparius*; the specimen was collected in New Guinea by Dr. Richard G. Zweifel, Chairman and Curator of Herpetology.



A temporary outdoor exhibit that has been displayed at the 77th Street entrance to the Museum is examined by artist Alan Sonfist (right), who created it, and Mr. Dore Schary, Commissioner of Cultural Affairs for the City of New York. Below, Dr. Malcolm C. McKenna, Frick Curator in the Department of Vertebrate Paleontology, as he appeared in the CBS-TV documentary, "The Natural History of Our World: The Time of Man."

The research of Dr. Jerome G. Rozen, Jr., involves the classification and evolutionary relationships of bees. Above, *Panurginus albopilosus*, a bee he found in 1968 in Oued Cherrat, Morocco. Below, guests are arriving for the formal opening of the Hall of Mexico and Central America. From the left, Mexican Ambassador Hugo B. Margain, Mrs. Margain, Mexican Consul General Eugenio V. Pesqueira, Mrs. Pesqueira and Mrs. John S. Hilson.



REPORT OF THE DIRECTOR



One of the most important characteristics of the presidency of Mr. Gardner D. Stout has been his continuing effort to increase involvement of the members of our Board of Trustees in the affairs of this Museum. I strongly share his enthusiasm in this effort, in the certainty that the Museum has nothing but good to realize from close cooperation among our highly respected staff and the talented and experienced men and women who compose our Board. Perhaps the most significant accomplishment during this first year of my service as Director has been the formation of fruitful and enduring relationships with active Board members and their committees.

Part of my confidence in the ultimate success of this deeper commitment of trustees to our work lies in my conviction that this is a sound way to run an institution that was founded and continues to exist primarily for public benefit.

It is self-evident that The American Museum of Natural History must have a competent staff of professional employees to carry out its varied and complex functions. At the same time it must have an interested and active Board to assess its work, the direction it is taking and the extent to which its objectives are being realized, and to see that its obligations to the society it serves are fulfilled. This relationship between our lay Board and our professional staff works best, I am convinced, when trustees and staff know one another well, recognize and respect the roles each must play and carry out their responsibilities vigorously and enthusiastically. It is the potential for achieving this that is most encouraging in Mr. Stout's efforts to increase the personal involvement of our trustees.

And we are fortunate in having on our Board men and women of broad experience and keen interest who have taken up the challenge offered by our President. Working closely with the staff, they have become informed in areas of our work on many levels, in many ways. They have taken the time and trouble to listen to the staff, to investigate and understand the problems we face, to evaluate and criticize the solutions we propose and, when convinced, to support our aims and programs. The record of their involvement over the past year is, in many ways, the record of our major accomplishments.

Under the leadership of Mrs. Constantine Sidamon-Eristoff, the trustee and staff members of the Committee on Exhibition have reshaped our exhibition program and its financing. There has evolved from the work of this group a better framework within which we can plan and construct exhibits to reflect modern and exciting design techniques, sound and relevant science,

effective education and more efficient security and maintenance. The planning of a large new gallery for temporary exhibition, which will open with its first show during 1971, was a direct outgrowth of this committee's concern for bringing to public attention the rare, beautiful and significant treasures that are so plentiful in the Museum's collections.

The selection and appointment of a new chairman for the Department of Education was a major step in realizing our ambitions to strengthen and reshape educational services for school classes and the public. Stimulated and supported by Mr. W. Gurnee Dyer, Chairman of the Education Committee, steps have already been taken to furnish Dr. Malcolm Arth and his program with the staff, finances and facilities needed to realize the educational potential of our resources. The interest and concern of Mr. Dyer and the trustees and staff who worked with him was reflected in the planning and financing of a new center for visiting school classes. The new school class orientation center will accommodate up to 60 school classes per day, serving many functions important to their museum visits. It will open in early 1971.

The Housekeeping Committee, under the leadership of Mr. David L. Luke, 3rd, continues to assist us in achieving the aims of the major study it completed during 1968. In addition, this group has worked closely with the administration and with the Museum's consulting architect in the development and evaluation of a master plan for assessing our space needs, utilizing our space and facilities most effectively, and planning for their future growth. Though still incomplete, the master plan has already produced guidelines that have influenced the location and design of new exhibition halls, science laboratories, and service and business offices.

At the April meeting of the Board of Trustees, I had the opportunity to present my views and plans for the future administration of the Museum. In my address to the Board, I emphasized the importance of the Museum's commitment to scientific research, which has been in so many ways the foundation of the greatness we have achieved over the past century. But I also expressed concern for the direction that our science will take in the years ahead. I feel it is time to examine the tradition that has produced the scientific departments we now support and the division of our resources among them. The Museum, I believe, ought to find internal strength to assess itself as an academic institution (as the university does from time to time), to restate its objectives and measure the appropriateness of its program toward their realization and to

At the beginning of 1970 the Museum announced a campaign to raise \$25 million in capital funds, the first such campaign in its 100-year history. Osborn Elliott, Editor-in-Chief of *Newsweek* and a Trustee who is Chairman of the Centennial Campaign Committee, is shown before the microphone at a press conference.

reorganize and redirect that program if necessary.

Toward this end, I asked our President to appoint a committee of trustees and staff to carry out this task. Mr. David A. Shepard accepted the chair of the Science Policy Committee and has since nominated and organized the able group with whom he will work.

There is hardly any aspect of our Museum work in which we have not had the benefit of trustee interest and support in growing measure over the past year: Mrs. Francis H. Low and Mrs. Alexander P. Morgan in planning our social events, Mr. August Belmont and Mr. Gerard Piel in assessing our plans for *Natural History Magazine* and the latter in advising us on many publication problems, Mr. Rodney C. Gott in evaluating our pension program, Mr. Osborn Elliott in developing our centennial celebration plans, Dr. Alexander E. Eltz and Dr. Harold C. Haizlip in reviewing the Planetarium program, Mrs. Hart Fessenden in working with our women volunteers and Mr. Michael Lerner in continuing his support of the Lerner Marine Laboratory. These and many others have given their time, their concern, their advice, their knowledge and experience generously and willingly. The Museum and the public it serves have been the richer for it.

And it is a healthy institution that finds its trustees and staff working together so closely, finding in one another the interest, the talent and the energy to carry out its objectives and programs. The more we know one another and our work, the greater assurance we will have that our efforts are respected and encouraged, serving the purposes for which they are expended, toward the growth of knowledge in science.

G. Howard D. Nicholson
Director



The distinctions and honors bestowed upon Museum scientists during the year include the following:

Department of Animal Behavior: Dr. Howard R. Topoff was elected Vice-President of the New York Entomological Society and to membership in Sigma Xi.

Department of Anthropology: Dr. Gordon F. Ekholm was presented with an Award of Merit by the Lotus Club of New York. Dr. Robert L. Carneiro was elected a corresponding member of the Ethnological Society of Hanover, West Germany.

Department of Entomology: Dr. Lee H. Herman, Jr., was elected President of the New York Entomological Society.

Department of Herpetology: Drs. Richard G. Zweifel, Charles J. Cole and Charles W. Myers were elected to the Governing Board of the Society of Ichthyologists and Herpetologists. Dr. Zweifel was named to a three-year term on the Executive Council of the Herpetologists' League. Dr. Charles M. Bogert was appointed an Associate of the Department of Biology at the University of New Mexico.

Department of Invertebrate Paleontology: Dr. Norman D. Newell was cited as a founder of the Society for the Study of Evolution. Dr. Roger L. Batten was elected Secretary of the Friends of the Gastropods.

Department of Mammalogy: Drs. Richard G. Van Gelder, Sydney Anderson and James N. Layne were re-elected to the respective positions of President, Recording Secretary and Vice-President of the American Society of Mammalogists.

Department of Ornithology: The International Council for Bird Preservation established a medal in honor of Dr. Jean Delacour, and made the first presentation of the Delacour Medal this year. Mr. G. Stuart Keith was named President of the American Birding Association.

Department of Vertebrate Paleontology: Dr. Edwin H. Colbert was presented with The American Museum of Natural History Gold Medal; he was also appointed Professor Emeritus of Columbia University.

Archbold Biological Station: Mr. Richard Archbold was presented with The American Museum of Natural History Silver Medal.

Department of Education: Mr. Christopher J. Schuberth received an award from the National Association of Geology Teachers in which he was named as the outstanding geology teacher of 1969.

Staff changes are recorded below, including those effective July 1, 1970:

In the administrative offices, the following staff changes took place:

Mr. Charles L. Miles was appointed Manager of

General Services.

In the scientific and educational departments, the following promotions and appointments were made:

Department of Animal Behavior: Mr. Joseph L. DeSantis was appointed Scientific Assistant.

Department of Anthropology: Dr. Stanley A. Freed was promoted from Associate Curator to Curator and Dr. Richard A. Gould was promoted from Assistant Curator of North American Archeology to Associate Curator of North American Archeology. Dr. Morton H. Levine and Dr. Colin M. Turnbull were appointed Research Associates.

Department of Astronomy and The American Museum-Hayden Planetarium: Dr. Mark R. Chartrand, III, was appointed Assistant Astronomer, Mr. Robert S. Galandak was appointed Senior Lecturer and Mr. Helmut K. Wimmer was appointed Art Supervisor.

Department of Entomology: Mr. Raymond A. Mendez was appointed Scientific Assistant and Dr. Sixto Coscarón was appointed Research Associate.

Department of Ichthyology: Dr. James W. Atz was promoted from Associate Curator to Curator. Mrs. Avis H. Rumney was appointed Scientific Assistant and Mr. W. H. Butler was appointed Field Associate.

Department of Invertebrate Paleontology: Mr. Michael Dumont was appointed Scientific Assistant and Dr. James D. Hays was appointed Research Associate.

Department of Living Invertebrates: Dr. Ernst Kirsteuer was promoted from Assistant Curator to Associate Curator.

Department of Mammalogy: Dr. Guy G. Musser was promoted from Archbold Assistant Curator to Archbold Associate Curator. Miss Patricia W. Freeman was appointed Scientific Assistant and Dr. David J. Klingener was appointed Research Associate.

Department of Mineralogy: Dr. D. Vincent Manson was promoted from Assistant Curator to Associate Curator.

Department of Ornithology: Dr. Robert W. Dickerman was appointed Research Associate, Mr. John du Pont was appointed Field Associate and Dr. Joel Cracraft and Dr. M. Philip Kahl were appointed Research Fellows.

Department of Vertebrate Paleontology: Dr. Eugene S. Gaffney was appointed Assistant Curator and Mr. Ronald H. Brown was appointed Scientific Assistant.

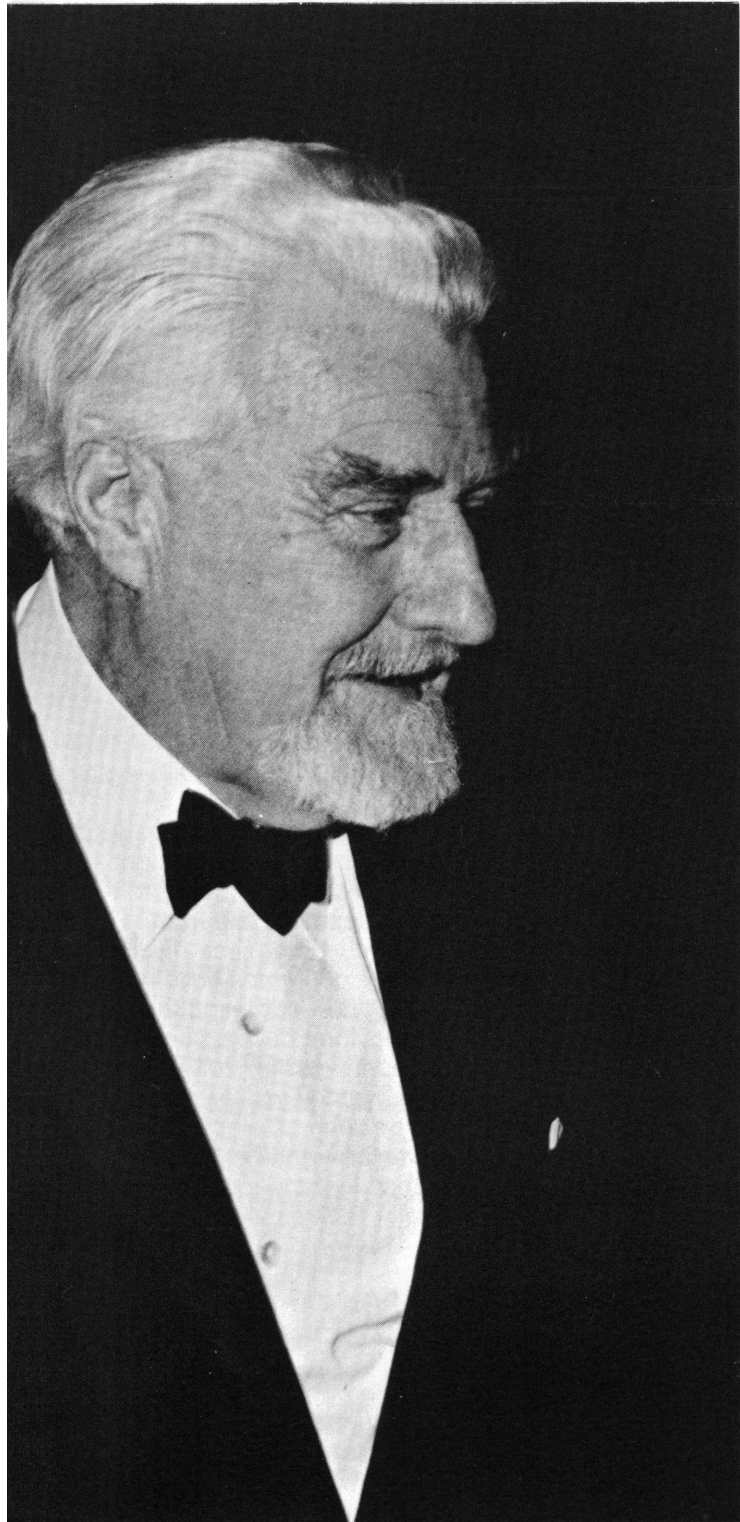
Department of Education: Dr. Malcolm Arth was appointed Chairman and Curator. Mr. Paul James Sanfacon was appointed Senior Museum Instructor and Miss Ellen Marie Costello and Miss Isabel Scott Fries were appointed Museum Instructors.

In the Library, Mr. Lorne James Amey was appointed Reference and Cataloging Librarian.

On *Natural History Magazine*, Mr. Alan Ternes was



Dr. Jean Delacour (left), Research Associate in the Department of Ornithology, is shown with Dr. Konrad Lorenz, the animal behaviorist. Dr. Lorenz was the recipient in January of the first Delacour Medal, which was established in honor of the ornithologist by the International Council for Bird Preservation.



appointed Senior Editor, Mr. John P. Wiley, Jr., was appointed Associate Editor and Miss Catherine A. Usher was appointed Promotion Manager.

The Museum family was saddened by the deaths of four distinguished associates during the year: Dr. Libbie H. Hyman on August 3, 1969; Dr. George Goodwin on September 29, 1969; Dr. Grace Fisher Ramsey on February 21, 1970, and Dr. Harold Anthony on March 29, 1970. Dr. Hyman had long been renowned for her monumental treatise "The Invertebrates," most of which was written during her 32 years as a Research Associate in the Department of Living Invertebrates. She had been awarded the American Museum of Natural History Gold Medal for her notable scientific achievements four months before her death. Mr. Goodwin, who had spent four decades at the Museum, retired in 1961 as Associate Curator in the Department of Mammalogy. He had participated in a number of major Museum expeditions and collected thousands of specimens for the collections. Dr. Ramsey had been at the Museum for many years before her retirement in 1952 and, at the time of her death, held the post of Curator Emeritus of School Relations in the Department of Education. Dr. Ramsey traveled widely on behalf of the Museum in order to collect original materials for the loan collections of the Department. Dr. Anthony was the Chairman of the Department of Mammalogy from 1942 until his retirement in 1958, and also served as Deputy Director of the Museum from 1952 until the fall of 1957. He was a leading mammalogist of his day and, during his tenure at the Museum, led in the creation of some of the celebrated mammal halls.

DEPARTMENT OF ANIMAL BEHAVIOR

Adult behavior is realized through a variety of life's experiences, by way of the continuous and subtle interactions of psychological and physiological processes. Although some behaviors may be functionally similar (reproduction, for example), this does not mean that identical behavioral processes exist among all animals. At each evolutionary (phyletic) level behavioral systems differ in the mode of organization and the way in which they develop. It is the main focus of the department's researches to study behavioral processes at various evolutionary levels.

In one study on mammals, Dr. Lester R. Aronson and Mrs. Madeline L. Cooper are examining the role of the major sensory modalities controlling the mating behavior of male domestic cats. They have found that sexually experienced males do not require their dominant sense, smell, in order to mate. This finding is unexpected, since in several other mammals—especially hamsters—olfaction is very important for mating behavior.

In another study on mammals, Dr. Ethel Tobach has been exploring the mating behavior of two closely related species of desert rodents which peacefully share the same ecological niche. Differences in emotional and social development allow for complementary behavior, permitting co-existence without fighting.

Bird navigation and homing are dependent on cues provided by the environment. Since Dr. Helmut E. Adler's investigations have not disclosed any special sensory equipment to explain the feats, he believes that birds probably learn to utilize these cues through their experiences rather than through some innate capacity or instinct.

Several members of the department are studying fish behavior, schooling, communication, isolating mechanisms, brain function and learning. Dr. Evelyn Shaw continues her researches on the development of schooling and finds that rearing conditions play a very important role in modifying species typical behavior when fish begin to school. Her researches have shown that the highly synchronous action seen among fish in schools can be altered if the fish are given specific kinds of early experiences.

Dr. William N. Tavolga's investigations of fish communication indicate that sound is probably the most important channel of communication in many species since it is independent of turbidity or water currents and it can give directional information. His researches also show that environmental circumstances appear to change the responsiveness of the fish to sound and light stimuli.

Dr. J. W. Gerald, a guest investigator working on fish

communication, has demonstrated that sound production constitutes an important part of courtship in six species of sunfish. However, the relatively high frequency of natural hybridization indicates that these fishes are still in the process of perfecting their cues for mate recognition.

Dr. L. S. Demski, a postdoctoral fellow, together with Dr. Gerald and Mr. Lawrence Picker, a volunteer, have been stimulating the fish brain electrically, by the use of permanently implanted electrodes in free-swimming individuals. With this technique, they have located regions of the brain involved in aggressive, feeding and reproductive behavior, and in vocalization.

Dr. Gerda Steiner, a postdoctoral fellow, is studying forebrain function in fish during and after the learning of various tasks. Her results indicate that the teleost forebrain controls general arousal levels and possibly modulates or integrates learned responses.

Among the southwestern army ants, workers that have just emerged from the pupal stage of development rest in the nest for several days and are relatively inactive. In their researches, Drs. Howard R. Topoff and Winifred B. Trackimas have found that although these workers are physiologically mature they do not participate in adult activities such as raiding. Research is continuing to find out why they are inactive.

Drs. Tobach, Aronson and Shaw organized a five-day international conference on the Biopsychology of Development as a major scientific event in the Museum's Centennial year. This conference brought together experts from many disciplines, ranging from molecular biology to child development and from anthropology to zoology. By exchanging their diverse views and expert knowledge the conferees have been highly successful in improving knowledge and theory in this relatively new area of behavioral development. In a large and highly successful open session in the Museum's auditorium, which overflowed into an adjacent hall where it could be seen on closed circuit television, several participants brought the views and deliberations of the conference to the public.

Lester R. Aronson, *Chairman*

UNDERGRADUATE RESEARCH PARTICIPATION PROGRAM

The Undergraduate Research Participation Program, now in its eleventh year, continues to be most valuable and to attract increasing staff interest and enthusiasm.

During the current fiscal year, 193 students applied and 29 were selected; of these 23 worked during the

Dr. B. F. Skinner, Professor of Psychology at Harvard University, is shown as he addresses an open session of the International Conference on the Biopsychology of Development. The conference, sponsored by the Department of Animal Behavior, was held in November, 1969.



summer and six during the academic year. Some students carried out their research at the Museum, others at the Archbold Biological Station or the Kalbfleisch Field Research Station, and two students did their work at the Naples Zoological Station in Italy. For some students this experience constituted an opportunity to participate in ongoing research. Eleven scientific papers, reporting research in which these students participated in major ways, were published or are in press this year.

Evelyn Shaw, *Program Director*

DEPARTMENT OF ANTHROPOLOGY

The opening of the distinguished new Hall of Mexico and Central America was a milestone for the Department of Anthropology. Planned and supervised by Dr. Gordon F. Ekholm, the hall is an imaginative presentation of the history of the pre-Columbián peoples of Middle America, and illustrates how 100 years of research and collecting can lead to the development of an important educational resource. "Gold of the Americas," a small, exquisite exhibition supervised by Dr. Junius B. Bird, was opened in conjunction with the hall.

A temporary exhibition, "Stone Toolmaking: Man's Oldest Craft Recreated," also was opened. A combination of artifacts and color slides, it explained the techniques used by man to make stone tools in prehistoric times and the successful duplication of this early technology by archeologists.

Dr. Walter A. Fairservis, Jr., reports progress on the new Hall of the Peoples of Asia. He also is preparing a temporary exhibition which will be called "Costumes of the Peoples of Asia." Work on the new Hall of the Peoples of the Pacific continues under the supervision of Dr. Margaret Mead, who is assisted by Miss Elizabeth Nickerson and Mr. Philip C. Gifford, Jr. Dr. Harry L. Shapiro is supervising a revision of the heart exhibit in the Hall of the Biology of Man, and has been working on a third section of the hall, which will deal with the biology of individuals interacting with each other and their environment.

Research efforts of the staff resulted in the publication of a number of scientific papers and books. Man's adaptation to urban life, a problem of urgent importance today, was the subject of studies by Dr. Stanley A. Freed and Dr. Shapiro. Dr. Freed continued his investigation of the effects of urbanization upon traditional village life in India, while Dr. Shapiro was concerned with the biological effects of crowding in Calcutta. Dr. Freed also continued his study of matri-

lineal and bilateral societies and Dr. Shapiro completed a population study in the Marquesas and in Rapa.

Dr. Bird continued his research on the antiquity of man in the Americas during a field trip to Fell's Cave, in southern Chile. He previously had worked at this important site in 1936-37. He obtained samples of charcoal from the hearths of all the later occupants of the cave for Carbon 14 tests and brought back an additional collection of artifacts.

Dr. Robert L. Carneiro has been studying cultural evolution through the technique of scale analysis, and the relationship between population density and size of administrative subdivisions in political states. His research also included the identification of a recently discovered Indian tribe, the Yuri, in the Amazonian region of Colombia and a study of the influence of Herbert Spencer on scientific thought.

Dr. Richard A. Gould spent much of the year in Australia studying the aboriginal peoples of the Western Desert, both their current culture and their prehistory as revealed through archeology. Dr. Mead conducted a field study of cultural systematics in New Guinea and the Admiralty Islands. She also continued a comparative study of perceptual communication in the West Indies and parts of the South Pacific.

Mr. Gifford studied the iconology of Uli figures from New Ireland. Dr. Louis B. Dupree spent the year conducting archeological excavations in Afghanistan. Dr. Fairservis continued his research on the origin and character of early civilization, working with the Hierakonpolis materials excavated in Egypt by the Museum expedition of 1969.

Dr. Charles F. Brush, III, continued his investigations of early pottery sites in Guerrero, Mexico, and spent several months excavating there. Mrs. Carin Burrows continued her studies of the Tibeto-Burman languages and collected additional data about the Asian bird-human diet, the Garuda.

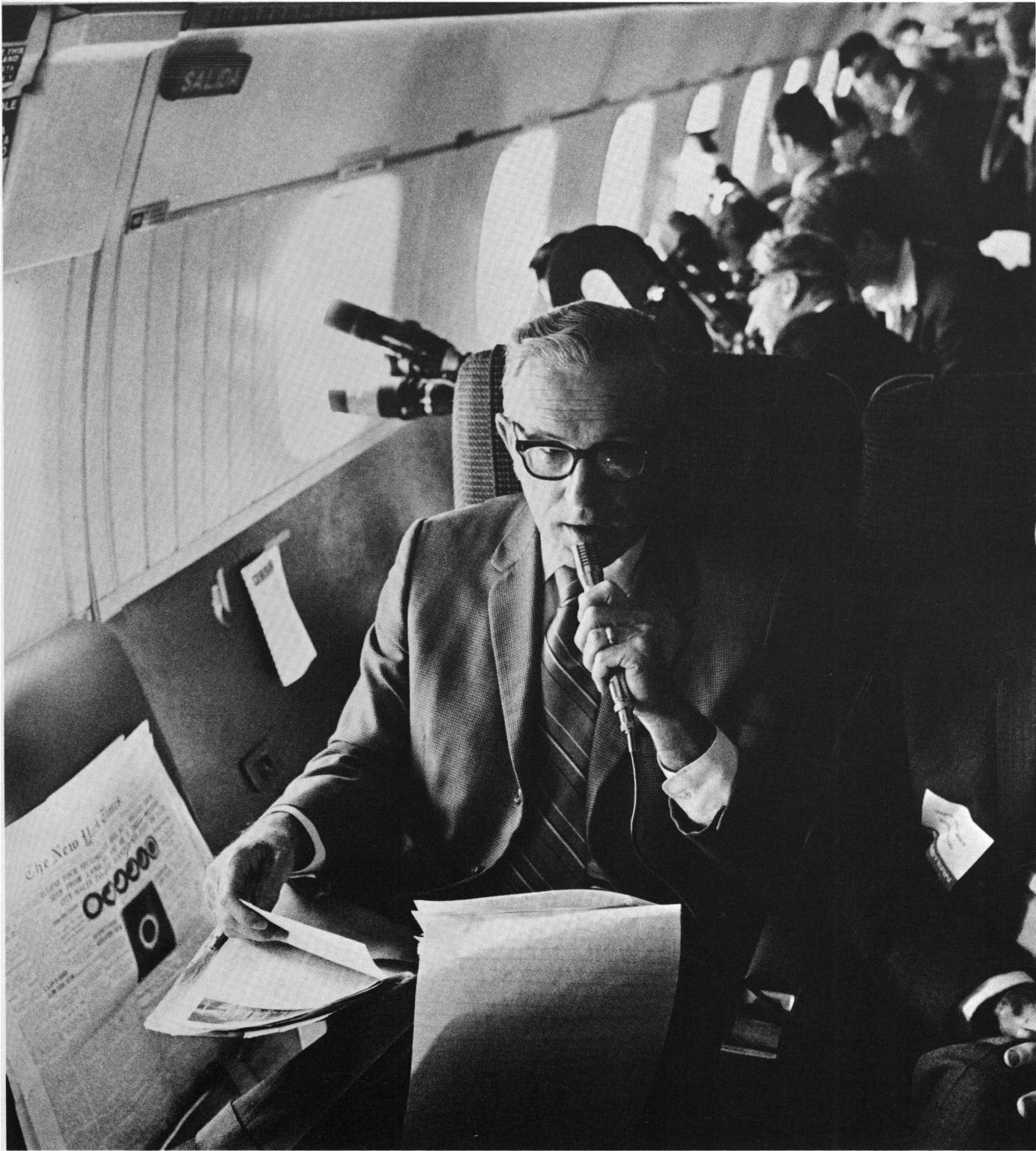
Miss Michiko Takaki and Mr. James Rauh, Ogden Mills Fellows, contributed to departmental research with their studies of the Kalinga of the Philippines and Mayan hieroglyphics, respectively.

Stanley A. Freed, *Acting Chairman*

DEPARTMENT OF ASTRONOMY AND THE AMERICAN MUSEUM-HAYDEN PLANETARIUM

The new Zeiss VI projector was unveiled on October 2, 1969. Formal ceremonies accompanied the re-opening of the Planetarium, which had been closed during September when the projector was installed and

While cameramen in the rear focused on the sun, Dr. Franklyn M. Branley commented on the progress of the solar eclipse on March 7. The setting is a jet plane flying over Nantucket.



the Star Theater refurbished. The new projector, the most advanced and sophisticated planetarium instrument in the world, is the third model to be used since the opening of the Planetarium in 1935. Auxiliary equipment still to be installed will include projectors for pictures of constellations and two panels of controls for the console.

To celebrate the landing of the Apollo 11 astronauts on the moon on July 24, the Planetarium provided an appropriate setting for a splashdown party sponsored by Western Union International, with American Airlines as a co-host. A giant television picture was projected on the dome of the Star Theater and 800 guests watched the astronauts end their journey.

A group of newsmen and astronomers observed the total eclipse of the sun on March 7, 1970, from an Eastern Airlines jetliner flying 40,000 feet above Nantucket, Massachusetts. Dr. Franklyn M. Branley explained the sequences of the eclipse as they occurred. At the same time a throng of people in Central Park watched a partial eclipse; Mr. Henry Krul, a Planetarium lecturer, was there to answer their questions. The next solar eclipse in the eastern part of the United States will take place on May 1, 2079.

The education program, with established courses in astronomy and space science, was active. Two workshops for teachers were well received and will be continued. A year-long special program for high school students and a project to develop procedures for teaching astronomy are under consideration.

Staff members participated extensively in press, radio and television activities, particularly at the time of the eclipse. Many of these received national coverage. The Starcaster features were carried by 60 domestic radio stations, the Voice of America and 300 stations of the Armed Forces Radio.

One request made by the Shah of Iran, during his New York visit in October, was to see a sky show at the Planetarium. A suitable time was arranged for the Shah and his party to see the show and Dr. Thomas D. Nicholson presented a lecture.

Sales continued to rise in the Book Corner. The sales area, however, is antiquated and needs to be enlarged and redesigned.

Paid attendance for the fiscal year was 592,719, a good attendance in view of the closing of the Planetarium during the month of September.

Franklyn M. Branley, *Chairman*

DEPARTMENT OF ENTOMOLOGY

The most important event of the year in the Department of Entomology was the arrival from England of Dr. John A. L. Cooke, a specialist on spiders and other arachnids. Dr. Cooke came to fill the vacancy left by the retirement of Dr. Willis J. Gertsch after 37 years of distinguished service. Dr. Cooke, who has been appointed Associate Curator, will add direction, energy and enthusiasm to the department.

Much of Dr. Cooke's time has been spent in rearranging the extensive collection of spiders (the department's specimens of spiders and related animals number 770,000). He also found time to participate in an expedition sponsored by Texas Tech University to investigate the arachnid fauna of the caves of the Sierra de El Abra in northeastern Mexico. He discovered representatives of the eleven known arachnid orders within two days; two orders generally regarded as being the rarest—the Ricinulei and Palpigradi—were found in considerable quantities.

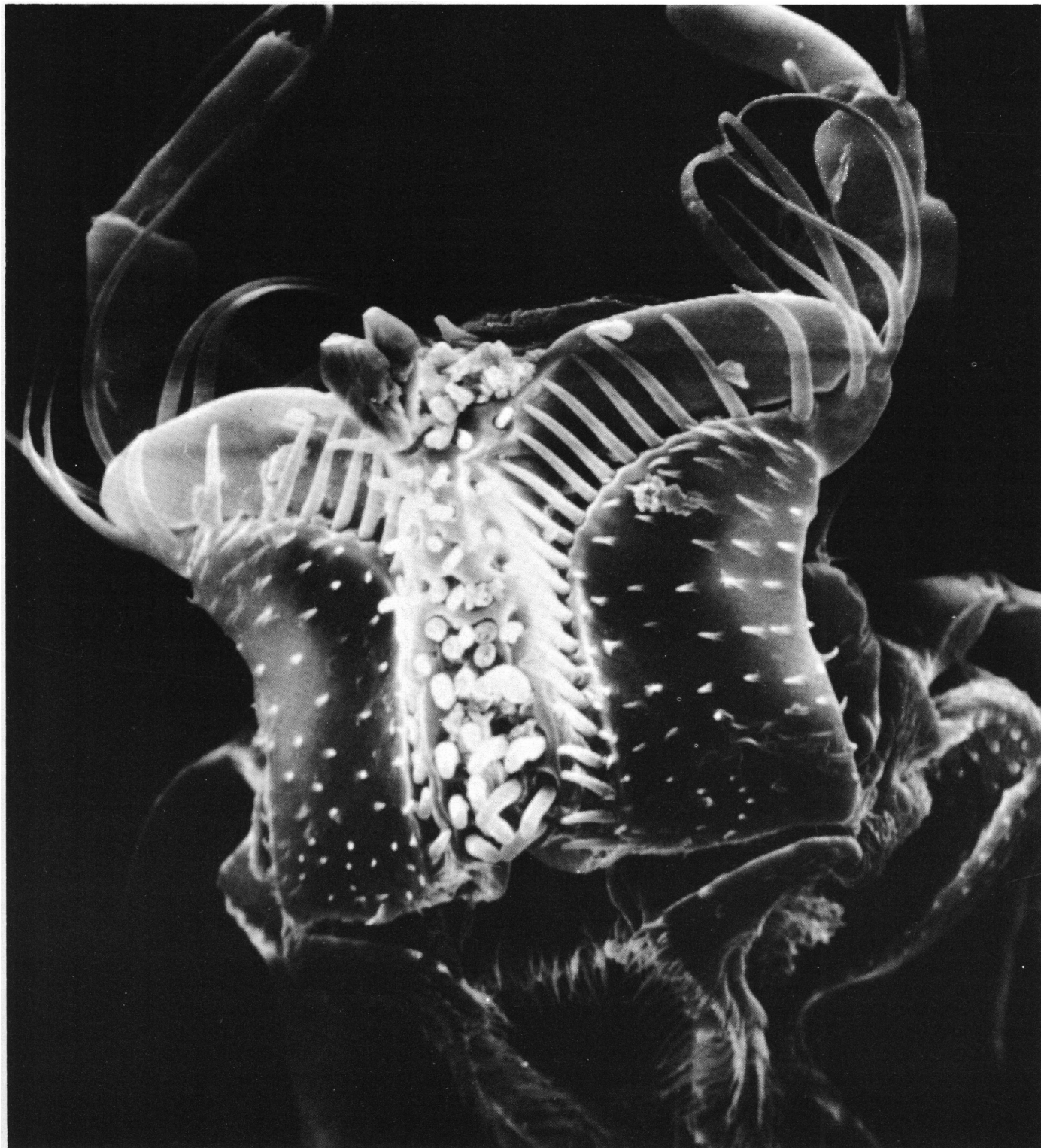
In the fall, Dr. Jerome G. Rozen, Jr., journeyed to the Atacama Desert of Chile, where he found a rich and virtually unexplored fauna of bees, his main research interest. His biological observations on the fideiid bee of the genus *Neofidelia* were of special significance because of his work the previous year on the related genus *Fidelia* which is found in South Africa. Only one species of *Neofidelia*, restricted to the southern approaches to the Atacama Desert, had previously been known. One of the highlights of Dr. Rozen's trip, therefore, was the discovery of another species belonging to the same genus.

Dr. Frederick H. Rindge continued his long-range studies of the inchworm moths (Geometridae) of the New World. After completing his revisionary studies of the genera *Hulstina* and *Pterotaea*, he investigated the members of the tribe Nacophorini from Chile and the adjacent Andean region of Argentina. A modern revisionary study of the taxonomy of this tribe in the southern Andean region has never been undertaken. Preliminary results indicate that five genera and about 40 species are included in the Nacophorini; three of the genera and 24 of the species have not been described.

For several years, Dr. Pedro W. Wygodzinsky and Dr. Sixto Coscarón have been working on an extensive research project concerned with Simuliidae (blackflies) in the cool and temperate areas of South America. During the past year they devoted much effort to laboratory work, which led to four papers incorporating the results of their field activities. Dr. Wygodzinsky also spent two months in Ecuador and Colombia where he collected a considerable amount of new material belonging to the genera *Gigantodax* and *Simulium*. In

This photograph of a rove beetle, genus *Bledius*, was taken by Dr. Lee H. Herman, Jr., with the aid of a scanning electron microscope.

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Mexico, he discovered a new genus of blackfly.

The major research efforts of Dr. Lee H. Herman, Jr., were directed toward completing a monograph of the species of the rove beetle (genus *Bledius*) of the United States and West Indies. The monograph, to be published in three parts, will include photographs taken with a scanning electron microscope placed at Dr. Herman's disposal by Meadowbrook Hospital of Long Island.

The collections of the Department of Entomology grew by 127,115 specimens. A count of the species represented by definite types—holotypes, neotypes, lectotypes and cotypes—in the collections of the department reveals more than 14,000. In July, Dr. Paul Freytag of the University of Kentucky rearranged the collection of leafhoppers (Cicadellidae, Homoptera), and in April Dr. Nicholas D. Jago, then of the Academy of Natural Sciences in Philadelphia, reorganized the collection of grasshoppers (Acrididae, Orthoptera). Both of the collections had been badly neglected in the past, and the department is grateful to these men for arranging the specimens so as to make them available to the scientific community. We also acknowledge with appreciation the donation of the Hemiptera collection of the Museum of Comparative Zoology, Harvard University, to The American Museum of Natural History. The arrangements for this transfer were initiated by Dr. Wygodzinsky, who reports that approximately 56,000 specimens, with 76 holotypes and 400 other types, comprise the collection.

Jerome G. Rozen, Jr., *Chairman*

DEPARTMENT OF HERPETOLOGY

The appointment of Dr. Charles J. Cole brought to the department a third curator and a new approach to the departmental research in systematic herpetology. Dr. Cole works with the chromosomes of amphibians and reptiles in an effort to relate genetic data to evolutionary development. The Museum equipped a cytogenetics laboratory for this purpose, and research on a variety of topics—some conducted in collaboration with other members of the department—is under way.

Members of the staff were engaged in research in New Guinea and Latin America as well as at the Kalbfleisch Field Research Station on Long Island. Dr. Richard G. Zweifel joined a team of scientists aboard the research vessel, Alpha Helix, on an expedition to New Guinea, where he continued his long-term studies of the frogs of that island. The principal research of the scientists was a study of proteins as clues to systematic

relationships among vertebrate animals. Dr. Zweifel traveled widely in eastern New Guinea, where he collected amphibians and reptiles and made tape-recordings of the mating calls of frogs.

The group of which Dr. Zweifel was a part made a large and varied collection of animals—including species new to science—and took thousands of specimens of blood and tissue, which were preserved for future analysis. The preserved specimens of amphibians and reptiles exemplify the broadened approach to systematic studies. Such specimens continue to be of great importance in themselves, but whereas in the past they existed only as objects for study and as vouchers for the presence of a given species in a particular area, now they may also serve as vouchers for a microscope slide on which chromosomes are mounted, for frozen samples of blood and tissue awaiting biochemical analysis, for extracts of skin poisons undergoing pharmacological analysis and for a tape-recording of a mating call. It was once boasted that the Chicago stockyards utilized all of the pig except the squeal; systematic studies now preserve and make use of the squeal as well as more tangible parts. The collections made by Dr. Zweifel in New Guinea and by others in Latin America and elsewhere increased the size of the departmental collection by some 5000 specimens.

Dr. Charles W. Myers visited Panama and Colombia, where he worked with Dr. John W. Daly of the National Institutes of Health in a continuing study of the biology of tropical arrow-poison frogs. They traveled 3000 miles by jeep and walked four days with pack horses in pursuit of the small, brightly colored frogs, some of which are still used by Indians as a source of poison for blowgun darts. One species of Colombian frog contains a poison surpassed in potency only by a few bacterial toxins. This venom has selective effects on membrane permeability and is proving an important research tool in the study of nerve transmission. One of the purposes of the trip was to survey as many kinds of poison frogs as possible for new, naturally occurring compounds of biomedical interest. The principal concern of Dr. Myers is in incorporating the biomedical findings into a taxonomic and evolutionary scheme.

Herpetological Information Search Systems, an information project directed by Dr. Herndon G. Dowling, continued the publication of *Current Herpetological Titles*. By the end of the year, 3384 titles had been listed. Dr. Dowling reports that the installation of a telephone-connected computer terminal in the Museum provides access to various time-sharing systems for direct search of the bibliographic and index files. New ways of gathering and disseminating scientific informa-

tion are being developed, and these will be helpful to libraries and researchers in a variety of disciplines.

Reptile Hall had been closed during the previous fiscal year, and construction was begun this year on the new Hall of the Biology of Amphibians and Reptiles.

Richard G. Zweifel, *Chairman*

DEPARTMENT OF ICHTHYOLOGY

Research activities in the department cover a wide range of interests. Some studies have sought to illuminate the relationships and history of individual groups of fishes whereas other investigations have been concerned with fish distribution, ecology, behavior and sexuality.

Mr. Jonathan N. Baskin, graduate student in the department, has completed a major study on the relationships of some of the most bizarre fishes of the world, the naked parasitic catfishes of the family Trichomycteridae of South America. Although most of these fishes are small and wormlike, new evidence found by Mr. Baskin shows them to be intimately related to an equally specialized and odd group—armored catfishes that are completely encased in a series of overlapping, bony plates.

Dr. Gareth J. Nelson recently completed a study of pharyngeal teeth and placoid scales of sharks and, as a result of this work, has made some new and important proposals regarding the characteristics and origins of the dermal skeleton of vertebrate animals. Dr. Nelson also began work on the gizzard shads of the tropical Pacific as an outgrowth of last year's expeditionary work in Australia, and has extended his work on anchovies to a study of their jaw musculature.

Dr. Donn E. Rosen and Mr. Vincent J. Maglio, a former Undergraduate Research Participation Program student, have reported on a section of a continuing study of the reproductive ecology and habitat preference in mosquitofish which has been conducted at the Kalbfleisch Field Research Station during the last nine years. These fish are viviparous, and it was found that during their reproductive period the females in advanced pregnancy spend most of their time over light sandy areas that serve as nursery grounds for the young fish. Dr. Rosen, together with Dr. P. Humphry Greenwood, also completed a study on the evolution of a sophisticated hearing device in fishes, the Weberian apparatus, and of the relationships of the fishes that possess this structure. Dr. Rosen and Dr. Nelson have begun a joint phylogenetic study of the major groups of salmon-like fishes of the world. One of the interesting

conclusions reached in this report is that pregnancy can temporarily suppress a temperature-related migratory response in the mosquitofish.

Dr. C. Lavett Smith has completed a monograph on the American groupers in which he has attempted to clarify and stabilize their nomenclature, to provide scientific accounts of their biology, and to summarize the known distribution records of these fishes. He has continued his research on fish sexuality, in which he is contrasting ordinary bisexual reproduction with various types of hermaphroditism. Dr. Smith has found that the type of hermaphroditism that occurs—whether as a result of the natural transformation of males to females, or females to males, or synchronous hermaphroditism in which functional male and female tissue exist simultaneously in the same animal—is specific for different taxonomic groups. The discovery that a member of a currently recognized group has a different pattern of sexuality therefore casts doubt on its relationship to that group. His analyses of these primary reproductive characteristics of fishes have so far identified nine instances in which the relationships of certain groups of fishes should be questioned, and Dr. Smith's own osteological studies of these instances have confirmed the need for taxonomic reallocation.

Dr. Smith, as a member of the American Museum French Polynesia Expedition of 1970, made the first scientific collection of fishes around the island of Rapa. This collection was important not only because it was the first time this area was sampled but also because the island of Rapa represents a key intermediate location within a zoogeographic region of importance for an understanding of the distribution of Pacific marine fishes. Other collections were also made by Dr. Smith at various localities in the Tuamotu Archipelago.

The major bibliographic synthesis of current ichthyological literature, directed by Dr. James W. Atz, is progressing well. The 1968 and 1969 published literature has been covered and work on the 1970 literature is well under way.

The collection of fishes continues to grow, with 72,000 new specimens awaiting processing from this and last year's expeditions. Active use is made of the collections, not only by members of this department and the graduate students that it sponsors but also by research zoologists from other institutions who are pursuing problems in the systematics, physiology, genetics and biochemistry of fishes.

Donn E. Rosen, *Chairman*

This fossil snail from the Middle Permian Period is of interest to Dr. Roger L. Batten in his research. Approximately 250 million years old, it was found in 1914 in an open-pit tin mine in the Kinta Valley near Kampar in the Province of Perak, Malaysia.



DEPARTMENT OF INVERTEBRATE PALEONTOLOGY

Activities in the department take place within such broad disciplines as systematic zoology, evolutionary and ecological biology, oceanography, and historical and economic geology, all fields to which invertebrate paleontology makes major contributions. On July 1, 1969, the two Museum departments that had been devoted to this work—Fossil Invertebrates and Micropaleontology—became divisions of the new Department of Invertebrate Paleontology.

The work of Micropaleontology is mainly concerned with the operation of the Micropaleontology Press, the foremost facility for technical information and communications in the field of micropaleontology. It has been directed by Dr. Richard Charnatz, with the assistance of Miss Lili E. Ronai.

The Department of Invertebrate Paleontology conducts university courses in its laboratories in collaboration with Columbia University and Rutgers University (at Newark), two institutions with which the curatorial staff holds professorial appointments. One Columbia Ph.D. degree was granted during the year within this cooperative program, bringing the total to approximately 80 university advanced degrees earned in the past quarter-century with the aid of the Museum's combined facilities in these fields (Fossil Invertebrates and Micropaleontology). This record establishes the Museum as a leader among institutions of higher learning in the training of professional scholars.

The research programs of Dr. Niles Eldredge involved the investigation of functional morphology and speciation in Paleozoic arthropods, especially trilobites. His studies of evolution at the species level in Middle Devonian invertebrates have demonstrated that speciation was effected more by geographical location than by phylogeny. In favorable conditions, such as those during the Middle Devonian period of the eastern and central United States, it is possible to work out geographic distribution patterns with sufficient detail to enable an accurate assessment of both the times and places in which peripheral populations may arise.

Both Dr. Norman D. Newell and Dr. Roger L. Batten have been concerned with, among other things, the systematics of Upper Paleozoic mollusks. With Dr. Bruce Runnegar of the University of New England, Armidale, Australia, Dr. Newell completed a study of Brazilian fossil mollusks of the Permian age. These give some clues as to the probable timing of the break-up of the southern continents. The fossils also display unusual evolutionary phenomena heretofore associated particularly with the late Cenozoic history of the Caspian region. Dr. Newell also continues his research into the history of the coral reef community.

Dr. Batten, in a worldwide study of Middle Permian gastropods, has found that an Asian fauna has elements in Italy, Australia and Argentina. These observations, as with Dr. Newell's study, are important in solving problems of continental drifts, particularly in the Southern Hemisphere.

Norman D. Newell, *Chairman*

DEPARTMENT OF LIVING INVERTEBRATES

Field and laboratory investigations were combined to produce significant results in several research projects. Studies in the department concerned the evolution and zoogeography of marine molluscan faunas, the ecology, life history and taxonomy of free-living and parasitic worms, and the physiological processes that control growth and water metabolism in land crabs. Staff members continued to contribute to major programs of education, curation and exhibition.

Dr. William K. Emerson advanced his studies on the evolution of the late Cenozoic marine molluscan faunas of the tropical regions of the New World. In this work, he and his colleagues discovered several new species of gastropod mollusks living in the eastern Pacific Ocean. These investigations resulted in the publication of five scientific papers and the completion of two other manuscripts.

Dr. Dorothy E. Bliss, with Miss Stefanie M. E. Wang and Mr. Edwin A. Martinez, made progress on their investigations of the hormones that control limb regeneration, molting and color change in the land crab *Gecarcinus lateralis*. During the past year the hormones were subjected to treatment with several solvents, heat and certain enzymes that split proteins. The results suggest that the hormones causing color change are small combinations of amino acids known as peptides and the hormones that regulate limb regeneration and molting are small units attached to large peptides or proteins. Column chromatography is being used to separate out these hormones from crude extracts, so that their properties may be determined more accurately and they may be used in further experimentation.

Dr. Ernst Kirsteuer continued studies of invertebrates that have heretofore been poorly known: the worms of such groups as Nemertina, Gnathostomulida and Archiannelida. He conducted field and laboratory investigations in Colombia, Barbados and Panama, where he collected about 800 specimens from coral reefs and other substrata. He also initiated a study of interstitial marine nemerteans from the beaches off North Carolina, in collaboration with Dr. Rupert J. M.



Riedl of the University of North Carolina. Two papers of Dr. Kirsteuer's were published, four additional reports were accepted for publication and one paper was presented at the International Conference on Meiofauna at Tunis.

Dr. Horace W. Stunkard continued his investigations on the life-cycles, developmental stages and successive hosts of trematode parasites of snails, fishes and birds. Five of his papers were published during the year.

More than 50,000 specimens, mostly mollusks, were cataloged and added to the reference collections. Staff members continued to counsel undergraduate and graduate students in their academic studies. Courses for children and adults were conducted under the auspices of the Department of Education.

Members of the department supervised the scientific content for several exhibits in cooperation with the Department of Exhibition. A large diorama depicting the marine biota along the coast of Newfoundland was opened in the Hall of Ocean Life and Biology of Fishes. An exhibition of giant and unusual invertebrates was completed in the Hall of the Biology of Invertebrates.

The death of Dr. Libbie H. Hyman on August 3, 1969, was felt deeply in the Museum and, indeed, by biologists around the world. Her reputation as the leading American authority on invertebrate life was such that scores of professional zoologists wished to correspond with her or, upon visiting the Museum, to meet her. Dr. Hyman's influence on staff scientists and visiting students stemmed not only from the quality of her life's work but also from her dedication to science and her courageous character.

William K. Emerson, *Chairman*

DEPARTMENT OF MAMMALOLOGY

The rise in public concern with the dangers of a destroyed environment and the concomitant problems of overpopulation and pollution are drawing heavily on the accumulated knowledge and expertise of the Department of Mammalogy. Dr. Richard G. Van Gelder, Dr. Sydney Anderson, Dr. James N. Layne, Mr. Hobart M. Van Deusen and Miss Patricia W. Freeman gave more than 20 lectures to public, municipal, legislative, school and private groups and served as well on a number of panels and advisory boards. Dr. Karl F. Koopman and Dr. Guy G. Musser provided much data for environmentalists, especially concerning the status of endangered species throughout the world.

Progress was made by staff members on a number of long-term projects. Dr. Van Gelder continued his

analysis of geographic variation in the South American hog-nosed skunks, and Dr. Anderson completed the first draft of his monograph, "Mammals of Chihuahua." Dr. Koopman studied at European museums to obtain additional data for his study of bats of Sudan, and Dr. Musser also spent several months at European museums to obtain information that is leading to the solutions of a number of long-standing problems on the rodents of Celebes and Southeast Asia. Mr. Van Deusen continued his studies of the New Guinea fauna and brought the account of the 1964 Archbold Expedition nearly to completion.

Under the direction of Dr. Anderson the department continued to prepare and cross-index the recent literature of mammalogy. Dr. Anderson also gave an advanced course in the Graduate Program in Evolutionary Biology sponsored by the Museum with the City University of New York. Dr. Van Gelder taught an advanced course at the State University of New York Downstate Medical Center in Brooklyn.

Curator Emeritus Harold E. Anthony, whose association with the Museum dated from 1911, died on March 29, 1970. Dr. Anthony was Chairman of the department and Deputy Director of the Museum at the time of his retirement in 1958. Curator Emeritus George G. Goodwin, who was a colleague of Dr. Anthony in the department since 1920, died on September 28, 1969. His monograph, "Mammals of Oaxaca," had been published a few months previously.

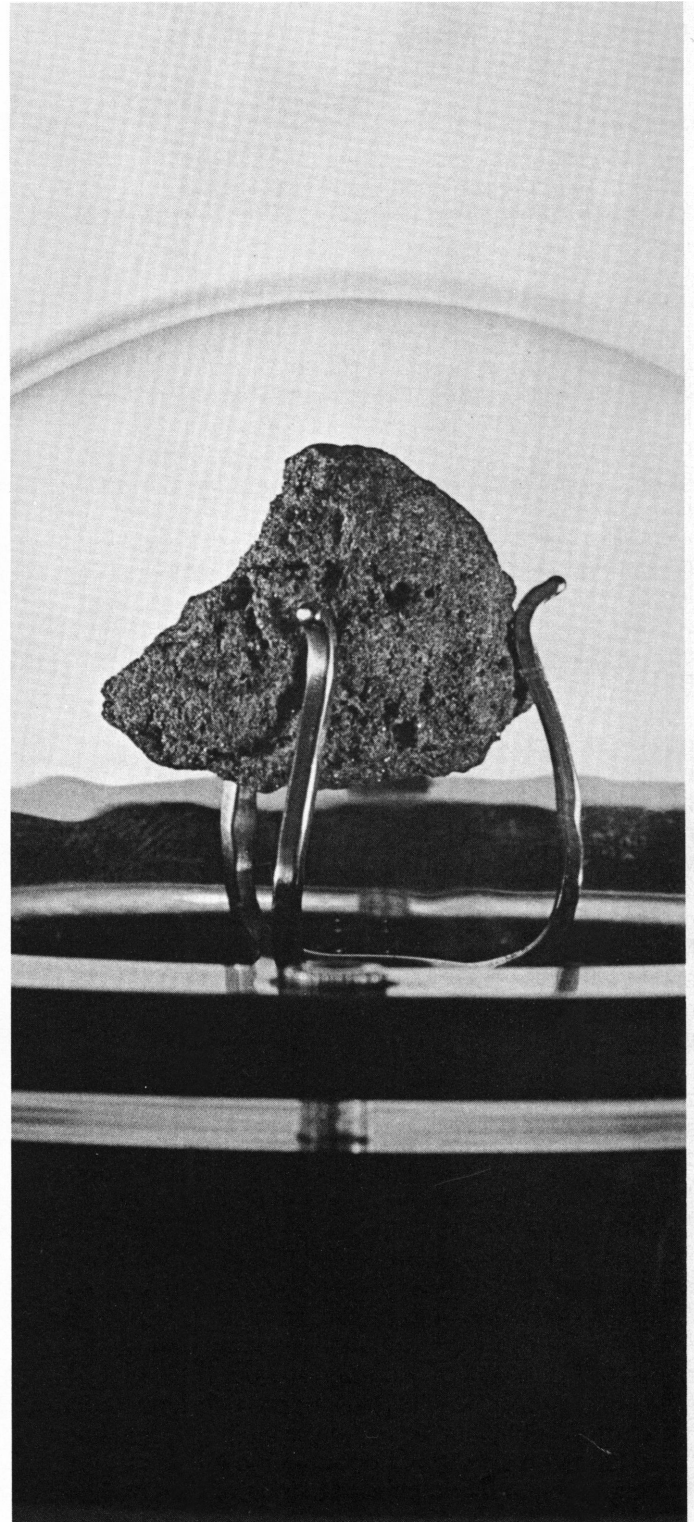
Richard G. Van Gelder, *Chairman*

DEPARTMENT OF MINERALOGY

An unprecedented number of visitors greeted the arrival of a sample of moon rock at The American Museum of Natural History. Through the courtesy of NASA and the Departments of Astronomy and Mineralogy, this special exhibit brought to the public a large measure of the excitement of the space age. The crystalline rock, rather nondescript at first glance, on closer inspection reveals its unearthly characteristics and suggests the wealth of information to be gained from further detailed studies. The opportunity for this kind of basic research, carried on behind the scenes, provides for this institution to be in the forefront of the world's natural history museums.

Dr. D. Vincent Manson, in continuing his inquiries into the chemical evolution of the earth's crust, is appreciative of the opportunities that the study of moon rocks provide for elucidation of problems of earth history. He is preparing a paper on the chemical varia-

This portion of a rock brought back by the crew of Apollo 11 from the moon drew thousands of visitors to the Museum for two and one-half months. It inspired dreams of space for these young visitors.



DEPARTMENT OF ORNITHOLOGY

tion found in the samples recovered from Tranquility Base. A related study is concerned with the chemical variation among various kinds of stony meteorites.

Mr. David M. Seaman completed a study on a pegmatite body in Connecticut, and continues research for a publication on pegmatite minerals of the world. Cooperation was extended to many institutions, most frequently in the form of supplying samples of minerals, rocks and meteorites from this department's invaluable collections.

Research and the publication of scientific papers is not sufficient in itself. A science must also communicate its endeavors widely and seek to achieve enlightenment such that man's life may be fuller. The Department of Mineralogy has had an active role in education this past year. The chairman of the department, as an adjunct assistant professor of geology at Columbia University, has given two graduate courses to 29 students and served as research advisor to two students. He also coordinated a series of adult education lectures, titled "Man and His Universe" as a lecturer in the School of Continuing Studies of New York University and held in conjunction with the Department of Education of the Museum.

Invitations as guest speaker to public groups associated with professional organizations, natural science museums, schools and amateur mineral clubs have been met two or three times per month. In addition numerous radio and television appearances have provided further opportunities for public education.

Considerable effort has been devoted to the development of plans for the construction of a new Hall of Minerals and Gems. The opportunities for including exhibits pertinent to man's need for conservation of his resources and the appreciation of his environment provide a stimulating challenge.

The introduction of more sophisticated computer capabilities at the Museum has been particularly successful. Nine of the Museum's scientific departments currently make use of these services; in Mineralogy a pilot project in computerized cataloging for the meteorite collection is underway.

Specimens of nine new meteorites were added to the collection as were some 400 mineral specimens obtained through gift, purchase and exchange. Outstanding among many fine specimens is a faceted gemstone of Tanzanite received as a gift from Tiffany and Co.

Response to the innumerable inquiries from the public and requests for mineral identification together with maintenance of the collection continue as essential activities of the department.

D. Vincent Manson, *Chairman*

During the year the Museum received the first award ever made to it for direct support of a program in graduate education by the National Science Foundation. The grant of \$57,000, to be matched by the Museum, will permit construction of laboratories and classrooms in the Department of Ornithology. The quarters will be used for the graduate program in ornithology and other fields of vertebrate zoology recently initiated by the Museum and the City University of New York, which has made an additional award to equip these new facilities. Dr. Wesley E. Lanyon, who is Curator of Ornithology at the Museum and an Adjunct Professor at City University, has accepted his first two graduate students under the new program.

The book, "Birds of Paradise and Bower Birds," by the late E. Thomas Gilliard was published by the Natural History Press, with a subsidy from the Frank M. Chapman Memorial Fund. It is the fitting climax to the series of books and papers left unfinished by Dr. Gilliard's untimely death. The book was completed largely through the efforts of Mrs. Mary LeCroy.

The department's active program on the rich avifauna of the American tropics saw publication of about a dozen papers by Dr. Lester L. Short, Jr.; further studies of tropical flycatchers by Dr. Lanyon, who was assisted in his field work in Venezuela by Mr. W. H. Phelps of Caracas, and the near completion of a volume on South American gamebirds by Drs. Jean Delacour and Dean Amadon. Meanwhile Dr. Charles Vaurie has begun a monograph on the large and remarkable family of South American ovenbirds, using the vast collection of the Museum which is under the able care of Assistant Curator Charles O'Brien.

Availing himself of one of the nature tours so popular today, Dr. Robert Cushman Murphy embarked from Punta Arenas near Cape Horn, visited a series of sub-antarctic islands, and landed at Cape Town, South Africa. Dr. Murphy, accompanied on this trip by Mrs. Murphy, was able to visit South Georgia Island for the first time since he spent some months there in 1912, as recounted in his "Logbook for Grace" and "Oceanic Birds of South America." Dr. Murphy found that, with the exception of the sadly depleted whales of the surrounding waters, the wildlife of South Georgia—from sea elephants to wandering albatrosses—is in better condition than it was 58 years ago.

The department has been pleased to participate in the active research on the unique seabird colony at the Museum's Great Gull Island. This has been done both through the field work of Mrs. LeCroy and the financial support of the Smith Gull Fund and the Frank M. Chapman Memorial Fund. The latter fund, in this time of

federal financial stringency, has proved a boon to young ornithologists. No fewer than 75 applications were received for the spring meeting of the committee, and it was possible to help about half of the individuals involved. In addition, two postdoctoral fellows, Dr. Joel Cracraft and Dr. Philip Kahl, have appointments under the Chapman Fund.

The many activities of the department are greatly aided by the Museum administration and by the efforts, often on a full-time basis, of volunteer associates, notably Mrs. W. Allston Flagg, Dr. Jean Delacour, Dr. Eugene Eisenmann and Messrs. James C. Greenway, John Bull and G. Stuart Keith.

Dean Amadon, *Chairman*

DEPARTMENT OF VERTEBRATE PALEONTOLOGY

Paleontologists are constantly attempting to fill the many temporal, geographic and evolutionary gaps in the fossil record. Their achievements are rarely as dramatic as those made in Antarctica this past winter. The discovery by Dr. Edwin H. Colbert and his field associates from the Polar Institute of Ohio State University of Triassic tetrapods and freshwater Jurassic fishes will provide important new data on the history and distribution of these long-extinct vertebrates. They are particularly significant as they bear on questions concerning the former continent of Gondwanaland and continental drift. Dr. Colbert is preparing a report on the amphibians and reptiles and Dr. Bobb Schaeffer one on the fishes.

Dr. Schaeffer completed a study of neurocranial ossification patterns in certain ray-finned fishes and he continued his investigations of North American marine fishes of the Triassic and Jurassic periods. His research makes use of collections obtained by him and other members of the department during the past decade.

Dr. Colbert, whose base is now the Museum of North Arizona, devoted his research time to Jurassic and Cretaceous reptiles as well as to the Antarctic project.

Dr. Malcolm C. McKenna made substantial progress on a revised classification of the Mammalia with the aid of Drs. Karl F. Koopman and Guy G. Musser of Mammalogy and Dr. Richard H. Tedford of Vertebrate Paleontology. He was also concerned with continental drift in relation to the distribution of the early mammals, and with related stratigraphic problems.

Dr. Tedford's several projects on the history of the Carnivora were pursued actively, as were his revision of the classification of Australian marsupials and his

paper on the Miocene stratigraphy and mammals from the Great Basin of California. In a more general vein he completed a paper on principles and practices of mammalian geochronology in North America. Dr. Tedford initiated a three-summer field project to search for early Tertiary marsupials in Australia.

Mr. Morris F. Skinner has been engaged in preparing reports on mammalian faunas that are included in Pliocene and Pleistocene deposits in central Nebraska. These reports are based on many years of field and laboratory investigation by the staff of the former Frick Laboratory. With Dr. Taseer Hussain, Mr. Skinner is also studying the evolution of locomotion in horses as revealed by changes in limb morphology.

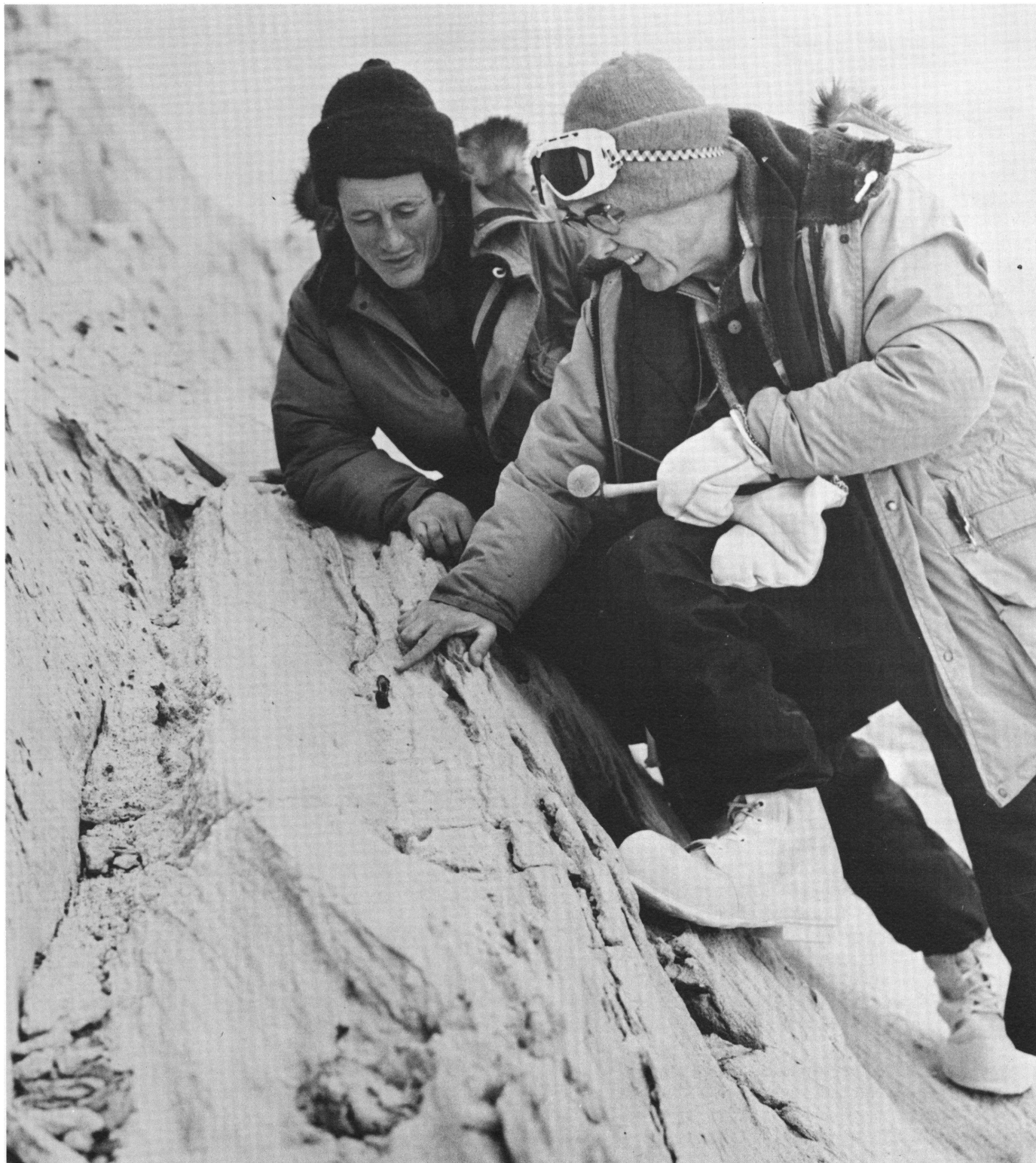
Mr. Ted Galusha completed a major paper on the late Tertiary Santa Fe Group of New Mexico and continued field and laboratory research on the stratigraphy and mammals of late Tertiary deposits in northwestern Nebraska. He has updated material on the large Pleistocene cats and on the Pleistocene wolves of Alaska for eventual publication.

Mr. Beryl E. Taylor concentrated on Tertiary horned ruminants and sent to press a review of the Synthetoceratinae, written in collaboration with Dr. Thomas Patton. His many years of research with the late Mr. Childs Frick on Tertiary camels led to the completion of a paper on the protolabines. Mr. Taylor is continuing the research program on fossil camels.

Aside from research and field programs, the Museum's Centennial Year was marked by two noteworthy events in the Department of Vertebrate Paleontology: the start of construction of the new Childs Frick Wing and the hosting of a very successful annual meeting of the Society of Vertebrate Paleontology.

Bobb Schaeffer, *Chairman*

The momentous discovery in Antarctica of Triassic fossils hitherto known only in Africa and Asia was made last winter. Here, looking at a bone in place at Coalsack Bluff, Antarctica, are Dr. Edwin H. Colbert (right), Curator of Vertebrate Paleontology at The American Museum of Natural History, and Dr. David H. Elliot, Assistant Professor of Geology at Ohio State University.



**ARCHBOLD BIOLOGICAL STATION,
LAKE PLACID, FLORIDA**

The primary emphasis of the research program directed by Dr. James N. Layne was to continue an intensive study of the population biology of the mammals at the station. Students from Wisconsin State University and the University of South Florida, working through the Undergraduate Research Participation Program of the Museum, and graduate students from the University of Miami and the University of South Florida aided in various phases of this investigation. In addition, laboratory studies of the physiology and behavior of several small mammals were carried out to illuminate their ecology and distribution. Dr. Harold Klein, on sabbatical leave from the State University of New York College at Plattsburgh, collaborated in this work.

Dr. Glen E. Woolfenden continued his research on the breeding birds of the station. He also made a census of the winter bird populations on permanent plots in each of the major habitats and began a detailed study of the population ecology and social organization of the Florida Scrub Jay.

A total of 27 investigators and 21 research assistants from 20 institutions in this country and abroad worked at the station during the year. As in the past, their projects covered many aspects of modern biology. Dr. Thomas Eisner of Cornell University and his associates continued their studies of the role of defensive substances produced by arthropods. Dr. Roger Morse, also of Cornell, and Dr. Rolf Böch of the Canadian Department of Agriculture investigated the role of pheromones in the swarm formation of honeybees. Dr. Hans Dreisig of the University of Copenhagen analyzed the effects of light and temperature on the flashing of the firefly *Photuris*. Drs. Michael M. Martin and Jean M. Martin of the University of Michigan studied the symbiosis between attine ants and the fungi that grow in their nests.

In addition to visiting researchers, 678 persons from more than 50 educational institutions and other organizations visited the station. There was a marked increase in interest in ecology among these individuals and groups. Some of the university classes conducted studies at the station as part of formal course work. For example, Dr. Richard B. Root of Cornell University taught a course in advanced insect ecology to seven graduate students. The independent and group research conducted by this class contributed significantly to knowledge of the station's ecology.

Mr. Richard Archbold continued to serve on the Advisory Board of Highland Hammock State Park. Dr. Layne, who is Vice-President of the American Society of Mammalogists, served as editor of its special pub-

lication series. During November and December Dr. Layne acted as consultant to the World Health Organization on a project concerned with the relationship between small mammal ecology and human disease. He also participated in an investigation of the effects of the Cross-Florida Barge Canal on the natural ecosystems of north central Florida, and was a member of a team that made a study of the influence of high water levels on the deer population of the Everglades.

Five papers by station personnel were published and eleven others are in press or are being prepared for publication. Twelve papers based on research by visiting investigators appeared during the year.

Richard Archbold, *Resident Director*

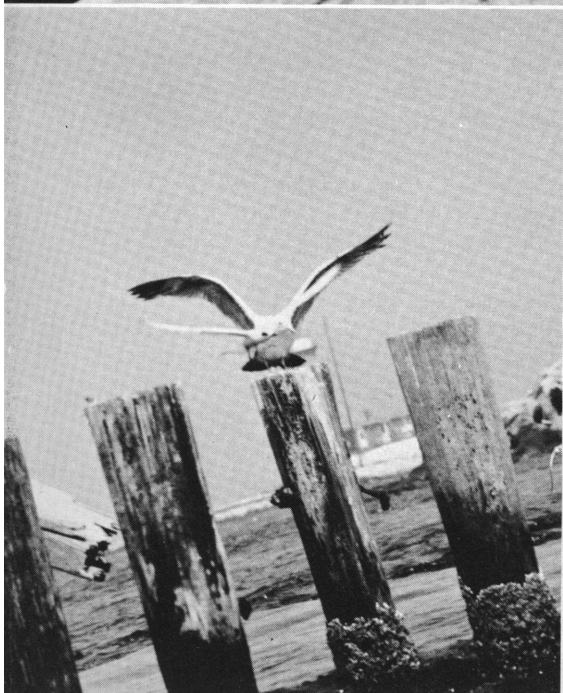
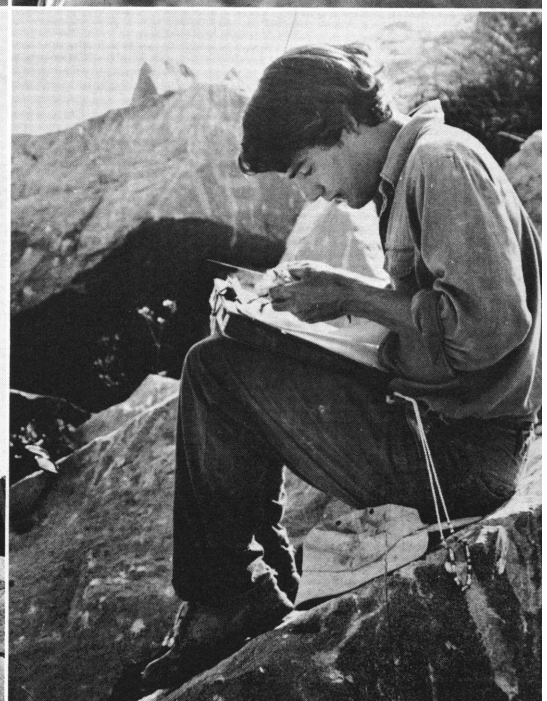
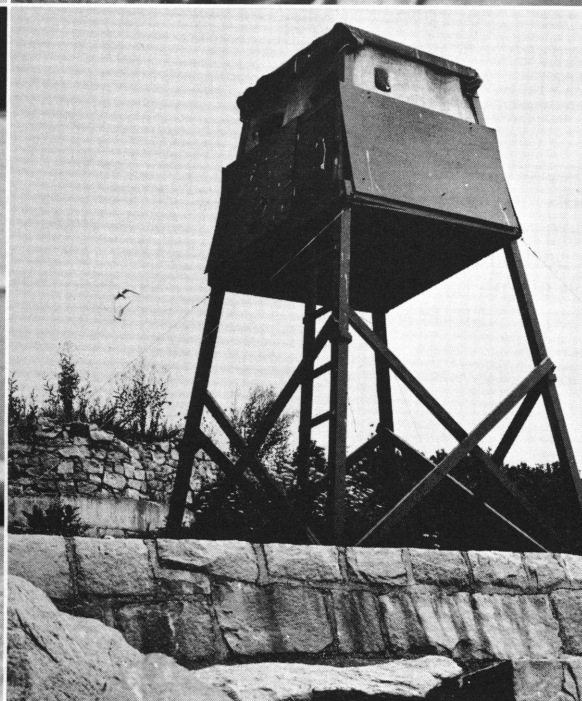
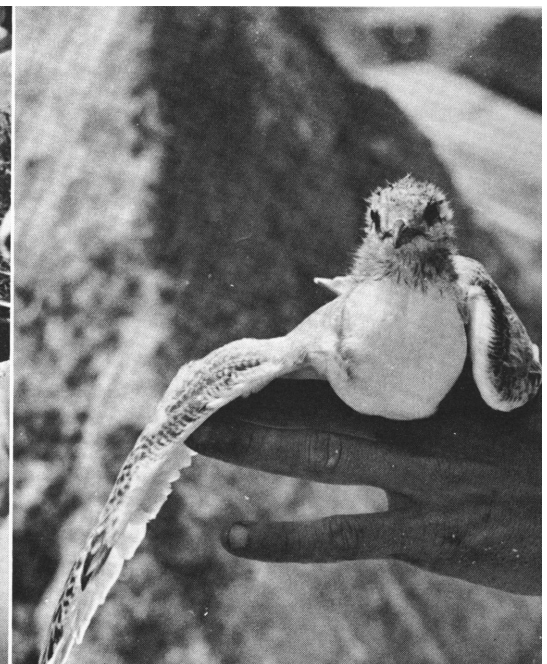
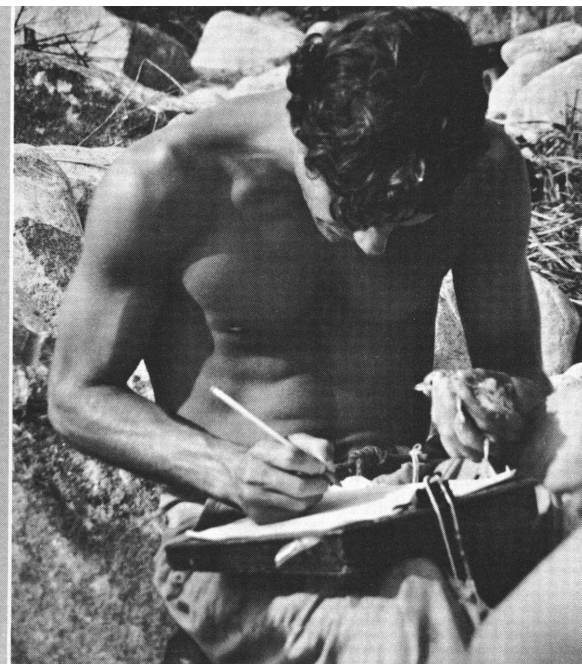
**GREAT GULL ISLAND
LONG ISLAND SOUND, NEW YORK**

During the summer of 1969 Roseate and Common Terns nesting in the colony on Great Gull Island were much more successful than they had been in 1968. The increased success was attributed to an abundance of fish and a season that was drier than usual. Late summer nest checks showed that the known egg dates had been extended by three weeks for the Common Tern and by six weeks for the Roseate Tern.

When color marked terns were followed during the post-breeding dispersal it was found that both species remained in Long Island Sound eight to ten weeks after the time at which they had been previously reported to have left the area. One young Roseate Tern, identified at Milford, Connecticut, on Oct. 3, was recovered on Oct. 27 on Gorgona Island off the Pacific Coast of Colombia in South America. This is the first documented record of a Roseate Tern from a breeding colony on the east coast of North America being picked up in the Pacific.

Staff members made two trips to Great Gull Island during the winter. On January 1 they saw about 50 Myrtle Warblers, a number of Cormorants, a few Chipping Sparrows and three seals. They returned to the island on March 7 for the purpose of banding as many Myrtle Warblers as possible. It was a first step toward determining the stability of the wintering population of warblers on the island. They will continue to band these birds during this fall and winter. Also, if conditions are favorable, an attempt will be made to cannon-net and band the wintering Cormorants.

Each phase of the group project undertaken in 1969 is being repeated during the 1970 field season. Data compiled last season suggest that the different patterns



used by Common and Roseate Terns in laying and hatching eggs may affect their rate of survival under varying environmental conditions. Data on survival and mortality in the two species were obtained during the extremely productive season of 1969 and during 1968, a year in which mortality was very high. It is hoped that conditions will prove to have been less extreme in 1970, thus enabling the staff to test the hypothesis that the two species succeed at different rates under different conditions.

A comparative study of the behavior of the Roseate and Common Terns will continue in 1970. For this purpose a twelve-foot observation tower overlooking one of the Roseate Tern nesting areas was constructed in the spring of 1969. It has proved to be a good vantage point from which to observe the behavior of this species early in the season.

The Fish and Wildlife Service has given permission to Miss Helen Hays to organize a cooperative banding project which will include participants from Nova Scotia to South Carolina. A single band, with a different color for each area, is being used to identify the Common and Roseate Terns.

Helen Hays, *Chairman, Great Gull Island Committee*

KALBFLEISCH FIELD RESEARCH STATION HUNTINGTON, LONG ISLAND, NEW YORK

In its twelfth year of operation the station continues to demonstrate the advantage of its easy accessibility to Museum scientists. In addition, the vegetation-management program, which was put into effect in order to maintain as great a variety of habitats as possible, has proved useful for the various programs of research. Eleven senior investigators utilized the station's facilities during the year.

In addition to long-term projects which have been previously reported, two new studies were initiated. Dr. Klaus D. Kallman, Research Associate in the Museum's Department of Ichthyology, has begun a comparative study of the habitat preferences of freshwater fishes of the genus *Xiphophorus*. Dr. Jon Greenlaw, Assistant Professor of Biology at C.W. Post College, is studying the reproductive behavior and ecology of the Rufous-sided Towhee, *Pipilo erythrophthalmus*, which is found in abundance on the station.

Kalbfleisch continues to serve as an important center for the training of college students in the natural sciences. Twenty undergraduates, representing sixteen colleges and universities, took part in this year's program. All of them were supported in part by the

Undergraduate Research Participation Program.

Graduate students continued to receive training in field research at the station through the Graduate Program in Evolutionary Biology, sponsored jointly by the City University of New York and The American Museum of Natural History. One candidate in this doctoral program, Mrs. Jacqueline Madden, initiated a study of the behavior and ecology of the southern flying squirrel, *Glaucomys volans* using radio telemetry. Her husband, Mr. Robert Madden, is using similar techniques in his continuing study of the population of box turtles, *Terrapene carolina*.

One of five publications produced during the year was a booklet entitled "The Vertebrate Fauna of the Kalbfleisch Field Research Station," written by Drs. Wesley E. Lanyon, Richard G. Van Gelder and Richard G. Zweifel. The new booklet summarizes information obtained by staff members and their student assistants on the distribution, relative abundance and population of the 187 species of amphibians, reptiles, birds and mammals that occur naturally on the station's 94 acres and adjacent properties. This 78-page record, together with the annotated description of the flora that was published last year, completes the inventory that was begun twelve years ago.

A newly constructed complex of aviaries, located in one of the station's grassland study areas, will be used by Dr. Lanyon in his continuing investigations of hybridization in meadowlarks (*Sturnella*).

Wesley E. Lanyon, *Resident Director*

LERNER MARINE LABORATORY BIMINI, BAHAMAS

Research activities have been increasing since the opening last year of the reconstructed and enlarged facilities. More than 150 scientists and their assistants who visited the laboratory found that the new facilities provide an environment highly conducive to productivity. Visitors ranged from graduate students to such a well-known figure as Dr. Konrad Lorenz, who spent some weeks preparing for a longer visit later in 1970 to study the bat fish, *Ogcocephalus*.

The staff of Research Associates continued their ongoing scientific programs. Among these are Dr. M. Michael Sigel's research in virology and immunology among elasmobranchs and teleosts, Dr. Arland L. Carsten's experiments with high dosage radiation, Dr. Perry W. Gilbert's various studies of sharks and Dr. C. Lavett Smith's investigations of spatial distribution of fishes on reefs.

Dr. Wesley E. Lanyon is using a tape recorder to capture the notes of song-birds at the Kalbfleisch Field Research Station. Later, a sound spectrograph furnishes a visual representation of each song by reducing the field recordings to a graph.



Dr. Jerome Wodinsky, Associate Professor of Psychology at Brandeis University, uses the facilities of the Lerner Marine Laboratory to study the drilling and feeding techniques of the octopus. Here Dr. Wodinsky (right) shows an experimental octopus to Mr. Philip Wylie, author and member of the Executive Committee of the Laboratory.

The long range program, concerned with the characteristics and distribution of acoustic information in the marine environment, proceeds under the direction of Dr. John Steinberg and Mr. Morton Kronengold of the Institute of Marine Sciences, University of Miami.

Dr. Jerome Wodinsky, on leave of absence from Brandeis University, continued his studies of the feeding mechanisms of octopuses.

Research conducted by Mr. Robert F. Mathewson included an investigation of the sensory systems of fishes and a study of amino acids and amines as cues for feeding and aggregations of sharks (conducted in collaboration with Dr. E. S. Hodgson of Tufts University). An additional study, being conducted with Dr. Wodinsky, Mr. Gilbert Liestner and Mr. Richard Beales of the Bahamian Government, deals with the natural history of the Queen conch, *Strombus gigas*.

A team of scientists from the National Cancer Institute visited the laboratory to carry on a further phase of their work on the blood brain barrier.

A credit-granting education program for both graduate and undergraduate college students was developed during the year. The program will have as its base a course in marine biology, to be offered by the laboratory in cooperation with Brandeis, Boston and Tufts Universities. The first course is to be presented early in 1971.

A 73-foot research vessel, designed and built by the late Dan Braman, Sr., specifically for marine research in the shallow waters of the Bahama Bank, was purchased from his estate by his family and presented to the laboratory this year. The vessel, to be known as the Dan Braman, has spacious research facilities and is one of the best of modern research vessels.

The Lerner Marine Laboratory *Newsletter* began publication during the year. It is being distributed to individuals, institutions and special libraries.

The laboratory is grateful to the Office of Naval Research for its continuing interest in and support of projects conducted here.

Robert F. Mathewson, *Resident Director*

SOUTHWESTERN RESEARCH STATION PORTAL, ARIZONA

A total of 627 guests, the largest number since its establishment in 1955, used the Southwestern Research Station during the year. Among these were 121 scientists and their assistants from 40 institutions in this country and abroad, and 283 students. The increase was attributed to the improved facilities at the station and to



the steady correspondence and meetings with scientists and educators.

The most active research was in the field of entomology, followed by herpetology, ornithology, mammalogy and arachnology. There were also a number of miscellaneous investigations such as a study of the ecology of temporary waters, studies of army ants and a search for parasites of the walnut husk fly.

Mr. Vincent D. Roth made a study of an intertidal zone spider, a new genus from Punta Peñasco in northern New Mexico which does not fit into the present family classification of spiders. He completed a generic description of the spider and made some notes about its biology and mating habits. The biology and taxonomy of the spider genus *Barronopsis* was investigated in an effort to determine the specific differences among females of this genus. Large numbers of this group of spiders were collected by Mr. Roth during a visit to the Archbold Biological Station and the Lerner Marine Laboratory.

Lectures on the scientific research at the station were given to fifteen groups. Thirteen papers based on work done here were published and three more are in press.

About 2000 insects have been added to the collection, bringing the total to 12,000. Among these are 300 additional species, including a collection of 46 orthopterans. Sixteen new species of plants from the vicinity of the station have also been added.

Vincent D. Roth, *Resident Director*

DEPARTMENT OF EDUCATION

The Department of Education continued to offer a variety of programs reaching a large number of people. Efforts devoted to young people, especially those in the New York City public schools, occupied a major part of the staff's time. Nearly 51,000 pupils were taught in programs supervised by Miss Marguerite Ross and Mrs. Marjorie Ransom. Although much of this teaching is done in the exhibition halls, auditoriums and classrooms are also used extensively for showing slides, films and artifacts from the Museum's stored collection.

The Natural Science Center for Young People, supervised by Miss Catherine M. Pessino, continues to attract both youngsters and adults. This year, the center was visited by more than 57,000 persons including over 4,000 children who came by appointment with school classes.

The Louis Calder Natural Science Laboratory, an adjunct to the Center, held Saturday workshop courses in botany, genetics, entomology, ornithology and city ecology.

Now in its fourth year, the program of Saturday Morning Classes for Young People was attended by nearly 1100 children. These included 32 underprivileged youths from the West Side neighborhood, to whom the Museum gave scholarships. The Saturday program contained courses in social and natural science. Enthusiasm for the course in oceanography was particularly high.

The courses and lectures of the Museum's Evening School for Adults have become known for their high standards and this year more than 6,600 persons enrolled. A special lecture series entitled "Can Man Survive?" was conducted this year; in it seven outstanding authorities spoke on the environmental crisis. The series drew more than 1500 persons.

The Department also presented 20 college level in-service courses for New York City teachers. These covered topics in geology, zoology, botany and anthropology. All were accredited by the City College of New York.

As part of the Museum's Field-Studies Program, revived last year, an archeology tour to Meso-America was led by Mr. C. Bruce Hunter. It focused on the Classical Maya archeological zones of Southern Mexico, Guatemala and Honduras. Four weekend field study tours, two for adults and two for high school students, were also filled to capacity.

For more than 25 years, Miss Farida A. Wiley has led nature walks for the Museum and her following has never diminished. Sometimes as many as 80 persons accompany her to Central Park.

A grant from the New York State Council on the Arts enabled the Department of Education again to conduct a Museum Training Course for personnel from other museums throughout the state. This program is to be repeated next year.

There were many continuing programs including Gallery Talks, Slide Talks, the Golden Age Program, the Nurse Education Program and several film series. The Hospital Visitation Program, supervised by Miss Catharine E. Barry, reached handicapped children in 130 hospitals and special schools this year. The Circulating Exhibit Division, supervised by Mr. Carlton B. Beil, handled some 5000 exhibits carrying dioramas, photographic displays and other types of portable visual aids to more than 360 schools.

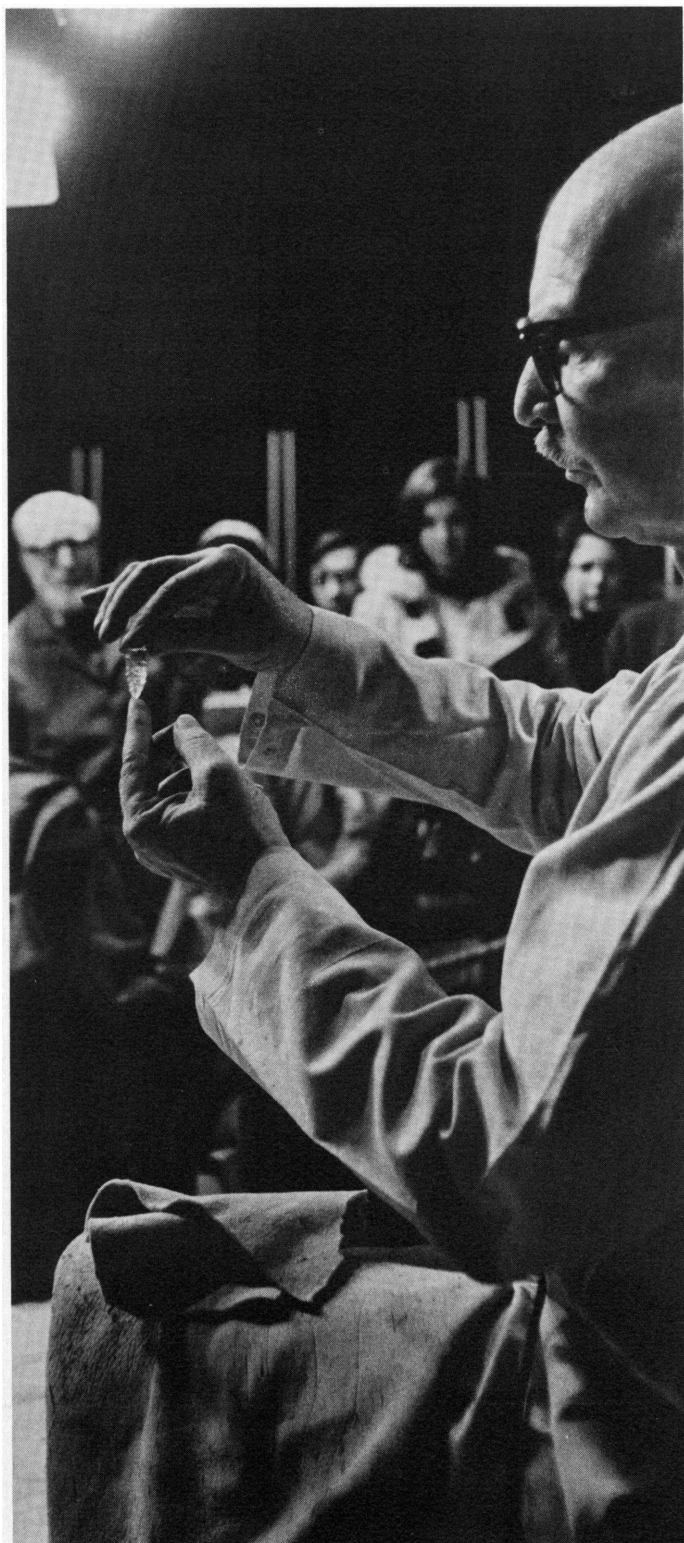
With the help of volunteers from the Women's Committee, the Information Desk operation supervised by Mrs. Miriam Pineo has become an increasingly dynamic center for dissemination of information.

At the end of the year Dr. Richard S. Casebeer resigned from the position of Chairman of the Department.
Malcolm Arth, *Chairman*

Pictured are three of the fourteen window panels of birds and mammals in outline that were made especially for the Museum Restaurant by Ugo Mochi, Italian-born sculptor.



The Corner Gallery was packed with interested spectators in February during the first week of the exhibition, "Stone Toolmaking: Man's Oldest Craft Recreated." They watched a demonstration by Mr. Don E. Crabtree of the techniques used by early man to make tools. Mr. Crabtree is showing his audience an arrowhead he has just made.



DEPARTMENT OF EXHIBITION AND GRAPHIC ARTS

The principal event during the past year was the completion and opening on May 16 of the new Hall of Mexico and Central America. Originally conceived in 1965 as a modest re-installation of artifacts, the design of the exhibits became progressively more ambitious and the final result incorporates unusual color, texture and lighting effects to enhance the display material. At the same time a small exhibit, "Gold of the Americas," was opened in the landing area adjacent to the entrance to the main hall.

The next major hall in preparation is that of the Peoples of the Pacific. Work has been increasing in the past twelve months, and it should be completed within the next year. Work also continued on the Hall of the Biology of Invertebrates.

Design and preparation of exhibits has now been started for the Hall of Amphibians and Reptiles, and construction is well under way. It is hoped to open this hall by the end of 1972. Preliminary exhibit plans are also being drawn up for the new halls of the Peoples of Asia and the Biology of Mammals.

Two temporary exhibits of considerable size and interest were mounted in the last year: "Design from Nature" in the African corridor on the second floor and "Stone Toolmaking: Man's Oldest Craft Recreated" in the Corner Gallery. The former, which opened on October 15, 1969, consists of more than 200 drawings, paintings and pieces of sculpture by 55 art students at Pratt Institute, based on their class studies in the Museum. The latter, which replaced the exhibit, "100 Years of Wonder," in February, 1970, combines artifacts and slides to show the techniques used by man in prehistoric times to make stone tools.

The newly designed John Burroughs exhibition was opened in the entrance to Education Hall on the 133rd anniversary of the writer's birthday, April 3, 1837. There were other renovations of exhibits, notably in the Akeley Memorial Hall of African Mammals and in the Hall of Ocean Life. In the latter the Underwater Birds habitat group was completely revised. Two large, floor-standing, portable exhibit cases were built during the year. These cases, which can be wheeled to wherever they are needed, housed a number of temporary exhibits: Iranian costumes and artifacts upon the occasion of the Shah's visit, the moon rock exhibit, Makonde sculptures and a teaser display of Mexican artifacts to draw attention to the new Hall of Mexico and Central America. The Exhibit of the Month was continued and ranged from displays of original art, first edition books and rare letters to an exhibit of a 200 million-year-old fossilized reptile.

In September, 1969, fourteen backlit window panels

of birds and mammals in outline were installed in the new Museum restaurant. Designed and executed by Mr. Ugo Mochi, these decorative works are an exceptionally beautiful addition to the Museum's art collection.

Notable among the activities of the Graphic Arts Division were the redesign of all floor plans and listings throughout the Museum, and the layout and production of a completely different concept for the 100th Annual Report, a format that will be followed in the future. This also marked the seventh and final year of the production of *Nature and Science* by the department. In addition there was the usual quota of promotion pieces, posters and art work for publication.

Gordon R. Reekie, *Chairman*

LIBRARY

A five to seven-year reevaluation of the collection was begun as part of a program to streamline and update the Library's services. Damaged books and journals as well as obsolete and duplicate books will be disposed of and other more valuable books will be sold at auction. The project is headed by Mr. Lee Ash, a library consultant. When it is completed Mr. Ash plans to present a program for enlarging and enriching the Library's collection.

Since 1968 the Library has been extremely active in lending books to other libraries as a result of the New York State Inter-library Loan agreement with the New York State Department of Education. It has been a primary source for materials on natural history that often are not available elsewhere. Under the agreement the Library lent 1838 books and periodicals in the first year and 2412 in 1969-1970. It also provided 15,357 Xerox copies this year to satisfy other requests.

In 1966, under a pilot grant from the New York State Council of the Arts, the Library began reclassifying and recataloging its books and periodicals into the system used by the Library of Congress. In the past year a total of 17,787 cards were searched and 8292 cards and 1161 search slips were ordered. Now that the project has been concluded, financial needs for cataloging the entire collection are being studied.

More than 1000 new monographs were received and cataloged during the year and a total of 13,069 issues of journals were added. This is a reduction of 1000 items from the total of the previous year as an effort was made to reduce the number of those journals that have little relevance to the present collection.

Between 12,000 and 13,000 persons used the Library for reading and approximately 55,000 items were

circulated among members of the Museum staff and the public.

Much needs to be done to improve the services of the room containing a collection of geological, geographical and topographical maps. Mr. Sidney S. Horenstein, Scientific Assistant in the Department of Invertebrate Paleontology, is reorganizing the room with financial support from the Library and the Council of the Scientific Staff. The most immediate need is for a map index.

Thomas G. Basler, *Librarian*

PUBLICATIONS

Major changes in the Museum's publication program were effected or were proposed during 1969-1970. These were changes in the relationship between the Museum and The Natural History Press, established in 1962 as a division of Doubleday and Company, Inc., to serve as the Museum's publisher.

Since its inception eight years ago, The Natural History Press has served the Museum under two separate contracts. One, known as the Royalty Agreement, provided for the establishment and supervision of new publishing ventures to extend the educational objectives of the Museum, and in which the Museum would benefit from any profits earned. The other, known as the Service Agreement, provided for the participation of The Natural History Press in the non-editorial functions of continuing Museum publications, in which the Press would benefit from additional circulation generated.

The Royalty Agreement produced two publishing programs, The Natural History Press Book Program and *Nature and Science* Magazine. Both have been highly respected in publishing and educational circles since their inception. But *Nature and Science*, after seven years of publication, was unable to sustain a circulation, in the fifth and sixth grade school market for which it was intended, at a level that could insure its financial stability. Thus, despite the high quality of its material and its great popularity as a resource for teachers, the magazine was forced to stop publishing with the completion of Volume No. 7 in May, 1970. It was with sadness and regret that this inevitable action was accepted by the publishers and the Museum administration.

The cooperation anticipated under the Service Agreement was never fully realized by either the Museum or the Press. In practice, the major publishing programs of the Museum, *Natural History* Magazine, Scientific Publications, Micropaleontology Press, and others, continued to operate independently in both

editorial and non-editorial activities. Thus the Service Agreement never achieved the objectives for which it was designed.

The Natural History Press Book Program continued, during 1969-1970, to be the outstandingly successful activity of the Press. Twenty-one volumes were published during the year, including:

- "Design with Nature," by Ian McHarg
- "Seeing and the Eye," by G. Hugh Begbie
- "Ideas in Evolution and Behavior," J. A. Moore (editor)
- "Nomads of the Long Bow," by Allan R. Holmberg
- "Audubon by Himself," Alice Ford (editor)
- "Coming of the Golden Age," by Gunther S. Stent
- "Birds of Paradise and Bower Birds,"
by E. Thomas Gilliard
- "Culture and Commitment," by Margaret Mead
- "Research Methods in Plant Science," by R. M. Klein
- "Peoples and Cultures of the Middle East," Volume I,
Volume II, by Louise Sweet
- "Tools of the Old and New Stone Age," by J. Bordaz
- "The Wolf," by L. David Mech
- "Woodland Indians," by Robert E. Ritzenthalers

There were, in addition, seven juvenile titles published during 1969-1970.

Recognizing that many objectives of The Natural History Press were not realized to the satisfaction of both parties, yet concerned that the successful Book Program continue to accrue benefit from the large back list in print, as well as continue to add to that impressive list, the Museum and Doubleday and Company, Inc., have been negotiating to terminate the present agreements and to substitute for them an agreement more in keeping with the program that has evolved and that each is anxious to continue. Agreement has been reached in principle, and it is expected that a new contract will be executed early in the next fiscal year.

Anticipating that there would be changes in the spirit and operation of its publishing program for the Museum, The Natural History Press did not replace Mrs. Ruth McMullin, who had managed the business and editorial affairs of the Press for most of the year, when she resigned in 1970.

Thomas D. Nicholson, *Director of the Museum*

CURATOR

This respected quarterly journal is now in its 13th year of publication. It published 338 pages in Volume XI, which completed four numbers during the year, and 232 pages were published in Volume XII, as yet incomplete. Its articles continue to be of great

significance to the museum profession. Circulation during the year remained close to the level of 1000.

With the retirement of Dr. Harry L. Shapiro, who had edited *Curator* for five years, Dr. Thomas D. Nicholson accepted responsibility for continuing editorial responsibility. He was assisted by Miss Janet Chernela of the Department of Education as Assistant Editor, and by the active participation of the Museum staff through the energetic efforts of the *Curator* Editorial Board.

Thomas D. Nicholson, *Editor-in-Chief*

NATURAL HISTORY

Natural History, now in its 70th year, continues its growth in both circulation and advertising revenue. The print order for the June-July issue exceeded a quarter of a million copies and virtually every issue in the last quarter carried a new advertiser.

Editorially, the magazine reached new levels of effectiveness. It has been frequently cited in legislative chambers throughout the country, and the special supplement, "The State of the Species," created a substantial impact on the readers, in various educational institutions and in the press.

This year also saw marked improvement in the magazine's appearance. A better grade of paper stock has resulted in a higher quality of printing and reproduction. Similarly, the weight of the cover stock has been increased, adding measurably to the staff's ability to produce striking covers.

On the debit side, the magazine continues to wrestle with its computer fulfillment problem, a difficulty made more severe by increasing circulation. The tangled subscriptions caused by the conversion to this new system have engendered many complaints. The one solace here is the intensity with which complaining readers insist on getting their magazines uninterrupted.

Alfred Meyer, *Editor*

SCIENTIFIC PUBLICATIONS

The Office of Scientific Publications published 43 numbers of *American Museum Novitates*, with a total of 1107 pages. In addition, five articles with a total of 442 pages in the *Bulletin* were published.

In press at the end of the fiscal year were five articles for the *Bulletin*, with an estimated total of 1000 printed pages, one part for *Anthropological Papers* with about 120 printed pages, and eight numbers for *Novitates*

with 165 pages. Four numbers for the *Novitates* series consisting of 276 typewritten pages, and three articles for the *Bulletin*, consisting of 492 typewritten pages, are in galley proof.

Florence Brauner, *Editor*

OFFICE OF PUBLIC RELATIONS

The many Centennial and other activities (including those of The American Museum-Hayden Planetarium and articles in *Natural History Magazine*) continued to receive national attention in the newspapers, magazines, radio and television. Among the most notable events were the formal ceremonies connected with the installation of the new Zeiss projector in the Planetarium; Macy's Thanksgiving Day Parade, which saluted the Museum's anniversary by featuring a dinosaur on a float; the opening of the Hall of Mexico and Central America, and the issuance of the four United States postage stamps honoring the Museum.

The new hall received wide publicity in all the media. John Canaday of *The New York Times* called it "A gem"; and *Newsweek* did a full page illustrated story on it. Stories on the Centennial stamps appeared in hundreds of newspapers throughout the country. The Coloroto Section of the *Sunday News* featured a cover color story on the new Zeiss projector.

Much publicity was given by all the news media to the moon rock which went on exhibition at the Museum on November 16. The exhibit drew record crowds, with 42,195 on its first day (the largest in the Museum's history).

The discovery in Antarctica of the fossil remains of a reptile which was identified by Dr. Edwin H. Colbert as *Lystrosaurus*, thus proving correct the theory of the continental drift, received much attention from the news media. *The New York Times* gave it front page coverage and the *Saturday Review* ran a cover story on the discovery.

Articles appearing in *Natural History Magazine* were given wide publicity. For instance, a story based on the magazine's special supplement on "The State of the Species," appeared in hundreds of newspapers and on radio stations throughout the world.

Public Relations News, the authoritative source of information about public relations, discussed the work of the office in its April 20 issue under the heading "Case Study No. 1247—Using An Anniversary To Build A New Public Reputation." The public relations activities of the Museum were given as a model of what could be done by an institution during its Centennial to show

that it is youthful and able "to serve modern needs."

The office assisted Mr. Marshall Flaum, writer and producer of the television program "The Natural History of Our World: The Time of Man." The telecasting of the program over the facilities of the CBS network in prime time on September 18 met with acclaim from television critics.

The Exhibit of the Month, created in cooperation with the Department of Exhibition and the scientific departments, provides an opportunity to obtain continuing exposure for the Museum in the daily media. Several of the exhibits had to do with the environmental crisis.

The staff was involved in the writing, editing and seeing through press of a number of popular and promotional publications. Among the innovations in this area were the new format for the Annual Report of the Museum and the beginning of publication of the *Newsletter* of the Lerner Marine Laboratory.

Roberto Rendueles, *Manager*

GUEST SERVICES

The scheduling of Museum space for activities sponsored by the Museum and other organizations, and the coordination of services for these programs, is the responsibility of the Guest Services Division.

As part of its Centennial Celebration, the Museum co-sponsored conferences and meetings of several national and international scientific societies. These meetings, which ran throughout the day, often had evening receptions and dinners. Additional scientific societies and groups that meet regularly in the Museum brought the total attendance for all programs held by outside organizations to approximately 18,000 people.

The Museum scheduled its own share of activities. These included a Centennial Capital Campaign Dinner, a Centennial Concert for Children, an environmental program in celebration of Earth Day and three evening affairs for the preview of the Hall of Mexico and Central America. At these special programs the Museum was host to 16,000 guests.

The publicity for the Centennial activities brought a surge of requests for information about the Museum and its programs for the public. Consequently, the *Calendar of Events* mailing list was increased and the telephone inquiries reached such a point it was necessary to install two telephone extensions carrying recorded messages to answer requests for general information. These lines, operating 24 hours a day, are a boon to those staff members who are frequently swamped with simple questions concerning Museum

hours and general program information.

Anna Montgomery, *Manager*

MEMBERSHIP

During the previous year memberships had totaled 137,601. Of these 3,784 were in the higher categories. In 1969 the total memberships were increased to 205,678, of which 4,118 were in the higher categories. A new class of membership replaced the long-standing minimal Life Membership. This class, called the Centennial, is an annual membership which offers extended benefits.

Special events for those in the higher categories of membership included previews of new halls and exhibits, free attendance at Planetarium shows with guests and a spring and fall series of special films. All have been well attended; the evening film shows filled the auditorium to standing room only.

Next year a new approach to the content of the Saturday morning shows for the children of members will be attempted. Plans are also underway to make a study of the present membership classifications with the intention of offering members a greater opportunity for involvement in the programs of the Museum.

The Members' Room not only serves the needs of many members but also is a source of information and aid for daily visitors to the Museum. On weekends, a volunteer receptionist continues to make the room available to members.

Marion B. Carr, *Membership Secretary*

PLANT OPERATION AND MAINTENANCE

Construction of the new ten-story Childs Frick Wing, which will house the Childs Frick Collection of fossil mammals, was begun in November, 1969. Located in the inner court between the Hall of Ocean Life and Biology of Fishes and Building Three, which faces 77th Street, it is expected to be completed by the middle of 1971.

Preliminary work was done on the rewiring of the Museum and it is scheduled for completion by the end of 1970. A related project, the installation of window air conditioners in offices and laboratories throughout the Museum, was undertaken.

William F. Pedersen and Associates has been given authority to prepare plans and specifications for three new exhibition halls. These will be the Halls of Minerals and Gems, Biology of Mammals and Peoples

of Asia. Plans were also drawn for a new Hall of Temporary Exhibits, which was expected to be ready by the fall of 1970. Raymond J. Rice and Associates has been authorized to modernize the elevators on the 77th Street side of the Museum as well as those on the Central Park West side.

Structural work in preparation for the new Hall of the Biology of Amphibians and Reptiles will be finished on October 1, when it will be turned over to the Department of Exhibition. Painting and other freshening work was done in the Halls of Birds of the World, Eastern Woodlands and Plains Indians, Late Mammals and Man and Nature. The Hall of Man in Africa and other existing exhibition areas will be given similar treatment.

Repairs were made on the roofs of the Hall of Ocean Life and Biology of Fishes and the Theodore Roosevelt Memorial, and the east and west stairways near the 77th Street Foyer are being completely rebuilt. Another project to be undertaken was the flood-lighting of the facade on the Central Park West side of the Museum.

The Maintenance and Construction Division lost Mr. Louis Ferry, Superintendent, and Mr. Frederick Pavone, Electrical Foreman, through retirement. Mr. Anthony Gallardo will succeed Mr. Pavone.

Frank G. Marmorato, *Plant Manager*

ATTENDANCE

During the year 3,544,586 persons visited the Museum, and 627,476 (including 592,719 paid admissions) visited the Planetarium, making a total of 4,172,062.

**THE AMERICAN MUSEUM
BALANCE SHEET,**

ASSETS:	<u>General Fund</u>	<u>Special Funds</u>
Cash:		
Demand deposits	\$ 99,240	\$ 956,303
Time deposits		503,058
Accounts receivable	476,983	22,668
Investments in Marketable Securities (Notes 1 and 2):		
Bonds		1,478,094
Preferred stocks		
Common stocks		
Total investments		<u>1,478,094</u>
Planetarium Authority bonds (Note 3)		
Prepaid expenses and other assets	253,205	
	<u>\$ 829,428</u>	<u>\$2,960,123</u>
 LIABILITIES AND FUNDS:		
Accounts payable and accrued liabilities	\$ 238,118	
Deferred income	1,085,657	
Advances from the City of New York	184,249	
Funds:		
General fund (deficit)	(678,596)	
Special funds (Note 4)		\$2,960,123
Endowment funds (Note 5)		
Investment in Planetarium Authority bonds		
Pension Fund		
Frick Employees Retirement Fund		
	<u>\$ 829,428</u>	<u>\$2,960,123</u>

OF NATURAL HISTORY**JUNE 30, 1970**

Endowment Funds	Investment in Planetarium Authority Bonds	Pension Fund	Frick Employees Retirement Fund	Total
\$ 61,574		\$ 28,202 20,000	\$ 7,689	\$ 1,153,008 523,058 499,651
24,883,162		6,665,688	219,588	33,246,532
2,450,664		474,418	65,146	2,990,228
19,798,691		4,209,990	237,825	24,246,506
47,132,517		11,350,096	522,559	60,483,266
	\$425,000			425,000 253,205
<u>\$47,194,091</u>	<u>\$425,000</u>	<u>\$11,398,298</u>	<u>\$530,248</u>	<u>\$63,337,188</u>
				\$ 238,118 1,085,657 184,249 (678,596) 2,960,123 47,194,091 425,000 11,398,298 530,248 \$63,337,188
\$47,194,091	\$425,000	\$11,398,298	\$530,248	
<u>\$47,194,091</u>	<u>\$425,000</u>	<u>\$11,398,298</u>	<u>\$530,248</u>	<u>\$63,337,188</u>

The accompanying notes are an integral part of these statements.

**SUMMARY STATEMENTS
FOR THE YEAR ENDED**

	General Fund
Balance (deficit), July 1, 1969	<u>(\$ 244,000)</u>
Additions:	
Appropriation from the City of New York	2,254,134
Gifts, bequests and grants (Note 6)	407,598
Interest and dividend income:	
Endowment funds	1,357,365
Other	28,504
Net profit (loss) on sales of investments	
Contributions of pension fund members and Museum (Note 8)	
Other income (Notes 3, 6 and 7)	<u>700,777</u>
	<u>4,748,378</u>
Deductions:	
Expenditures for:	
Educational activities	2,236,679
Special purposes and objects for which the funds were established	
Payments to pensioners and beneficiaries	
General administrative expenses	882,587
Plant operating and maintenance expenses	1,644,760
Pension and other social benefit expenses (Note 8)	<u>605,308</u>
	<u>5,369,334</u>
Transfers between funds	<u>186,360</u>
Balance (deficit), June 30, 1970	<u><u>(\$ 678,596)</u></u>

OF CHANGES IN FUNDS**JUNE 30, 1970**

Special Funds	Endowment Funds	Pension Fund	Frick Employees Retirement Fund
<u>\$3,108,592</u>	<u>\$46,084,677</u>	<u>\$10,926,881</u>	<u>\$560,411</u>
1,003,057	2,205,630		
409,719			
118,392		468,139	19,248
	90,361	8,568	(24,444)
		556,472	
<u>505,885</u>			
<u>2,037,053</u>	<u>2,295,991</u>	<u>1,033,179</u>	<u>(5,196)</u>
2,908,009			
		556,410	24,413
213,134	5,000	5,352	554
<u>59,596</u>			
<u>3,180,739</u>	<u>5,000</u>	<u>561,762</u>	<u>24,967</u>
<u>995,217</u>	<u>(1,181,577)</u>		
<u><u>\$2,960,123</u></u>	<u><u>\$47,194,091</u></u>	<u><u>\$11,398,298</u></u>	<u><u>\$530,248</u></u>

The accompanying notes are an integral part of these statements.

NOTES TO FINANCIAL STATEMENTS

1. The Museum maintains its accounts generally on an accrual basis; however, fixed assets (charged off at time of purchase), exhibits, collections, library, etc., are not reflected in the balance sheet. The land and buildings utilized by the Museum are principally owned by the City of New York.

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. Market valuations of investments at June 30, 1970 are as follows:

	Bonds	Stocks	Total
Special funds	\$ 1,471,000		\$ 1,471,000
Endowment funds	20,808,000	\$21,451,000	42,259,000
Pension Fund	5,216,000	4,578,000	9,794,000
Frick Employees Retirement Fund	194,000	209,000	403,000
Total	<u>\$27,689,000</u>	<u>\$26,238,000</u>	<u>\$53,927,000</u>

The aggregate carrying value of the investments in the above funds exceeded their market values by \$6,556,127 at June 30, 1970.

3. The investments bonds (\$570,000 principal amount) of The American Museum of Natural History Planetarium Authority is carried at cost. The financial statements of the Authority, which is operated under the supervision of the Museum's management, are annexed. Interest income of \$25,650 received during the year from the Planetarium is included in other income of the general fund.
4. The balance at June 30, 1970 of special funds (funds which are received or appropriated for specific purposes) is net of overdrafts of approximately \$160,000. These overdrafts represent expenditures in anticipation of gifts, grants, other income and transfers from other funds.
5. Endowment funds (including certain funds functioning as endowment) are summarized as follows:

	Restricted Purposes	Unrestricted Purposes	Total
Endowment funds, income available for	\$21,690,792	\$ 8,978,479	\$30,669,271
Funds functioning as endowment, principal and income available for	3,244,226	13,280,594	16,524,820
	<u>\$24,935,018</u>	<u>\$22,259,073</u>	<u>\$47,194,091</u>

6. The Museum owns an interest in certain mining properties (acquired by bequest) which is not reflected in the balance sheet. During the year, royalties of \$17,568 received from this source were included as other income in the general fund.
7. Other income of the general fund includes net income of \$255,269 from magazine and book shop operations. Gross income from these operations amounted to \$2,104,331.
8. The pension plan of the Museum covers substantially all its employees. The Museum and each member contribute to the Pension Fund 6% and 5%, respectively, of the member's compensation as defined. Contributions by the Museum (including the Planetarium Authority) amounted to \$303,452 for the year.

AUDITOR'S REPORT

The Board of Trustees,
The American Museum of Natural History,
New York, New York

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY as of June 30, 1970 and the related summary statements of changes in funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned statements present fairly the financial position of The American Museum of Natural History at June 30, 1970, and the results of its operations for the year then ended, in conformity with the accounting principles referred to in Note 1 applied on a basis consistent with that of the preceding year.

Lyzbrand, Ross Bros. & Montgomery

New York, August 12, 1970.

**THE AMERICAN MUSEUM
PLANETARIUM
BALANCE SHEET,**

ASSETS:		
Cash		\$107,435
Accounts receivable		1,273
Inventory, publications and souvenirs, at cost		24,050
Equipment, fixtures, etc. (Note 1):		
Zeiss planetarium instrument, at cost (Note 2)	\$221,928	
Less, Allowance for depreciation	<u>8,322</u>	
	213,606	
Furniture, fixtures and equipment	<u>1</u>	213,607
Building, at cost (Note 1)		569,209
Land (donated by the City of New York)		<u>—</u>
		<u><u>\$915,574</u></u>

**OF NATURAL HISTORY
AUTHORITY
JUNE 30, 1970**

LIABILITIES:

Accounts payable	\$ 14,939
4½ % Refunding Serial Revenue bonds, past due (Note 3)	570,000
Accrued interest, past due	<u>315,450</u>
	900,389

FUND:

Trust Agreement	2,000
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CONTRIBUTED CAPITAL AND DEFICIT:

Contributed capital:		
Charles Hayden	\$156,869	
Charles Hayden Foundation, increased \$128,530 during the year	<u>379,455</u>	
	536,324	
Deficit, as annexed	<u>523,139</u>	<u>13,185</u>
		<u><u>\$915,574</u></u>

The accompanying notes are an integral part of these statements.

Under the sponsorship of the Neighborhood Youth Corps, teenagers work as assistant guards at the Museum during the summer. Here they receive instructions in the Hall of the Biology of Man from Mr. Martin Rosenberg, formerly a Senior Instructor in the Department of Education.

**STATEMENT OF INCOME, EXPENSES AND DEFICIT
FOR THE YEAR ENDED JUNE 30, 1970**

Income:		
Admission fees, less allowances and commissions	\$501,762	
Auxiliary activity, sales booth	102,091	
Special lectures and courses	29,946	
Miscellaneous	8,856	\$642,655
Expenses:		
Preparation, presentation and promotional	238,226	
Operation and maintenance	169,016	
Special repairs and improvements	97,169	
Auxiliary activity, sales booth	76,890	
Administrative and general	21,756	
Pension fund, social security and other employee benefits (Note 4)	40,830	643,887
Loss before interest and depreciation		1,232
Interest on past due 4½ % Refunding Serial Revenue Bonds	25,650	
Provision for depreciation (straight line method) (Note 1)	10,011	35,661
Net loss for year		36,893
Deficit, July 1, 1969		486,246
Deficit, June 30, 1970		\$523,139

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 otherwise discharged. At that time, its personal property passes to The American Museum of Natural History and its real property passes to the City of New York to be maintained and operated in the same manner as other city property occupied by the Museum. It is the policy of the Authority to capitalize only major additions and replacements of equipment, machinery and other plant items and to depreciate such items over their useful lives. Fully depreciated assets are carried at the nominal value of \$1. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.
2. During fiscal 1970, a new Zeiss planetarium instrument was installed at a cost of \$152,710 after a trade-in allowance for the old instrument. The Charles Hayden Foundation contributed \$128,530 towards this purchase.
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.
4. Substantially all the Authority's employees are members of The American Museum of Natural History Pension Plan. Contributions to the plan by the Authority amounted to \$13,723 for the year.

AUDITORS' REPORT

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

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY PLANETARIUM AUTHORITY as of June 30, 1970 and the related statement of income, expenses and deficit for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned statements present fairly the financial position of The American Museum of Natural History Planetarium Authority at June 30, 1970 and the results of its operations for the year then ended, in conformity with the accounting principles referred to in Note 1 applied on a basis consistent with that of the preceding year.

Lyzand, Ross Bros. & Montgomery

New York, August 12, 1970.

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*Deceased September 3, 1970

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¹The President is an ex officio member of all advisory committees.

Young visitors have a close-up view of a tableau in the Hall of Man in Africa. The scene is the Rift Valley in north-west Kenya as a herder enacts a daily ritual, the painless drawing of blood from the neck of a young ox.





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COVER . . . The new Hall of Mexico and Central America concerns the history of a brilliant early civilization that thrived for 3000 years before the time of Columbus. Many of the objects shown from the Museum's collection are outstanding examples of sculpture, pottery and painting belonging to the varied cultures of the area. The hall, a testimony to the intriguing process of archeological discovery and interpretation, has been greatly praised for its artistic and sensitive presentations. The photograph on the front cover shows visitors regarding a full-size reproduction of the Aztec Stone of the Sun, commonly but mistakenly known as the Calendar Stone.