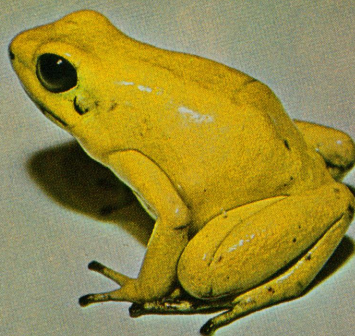
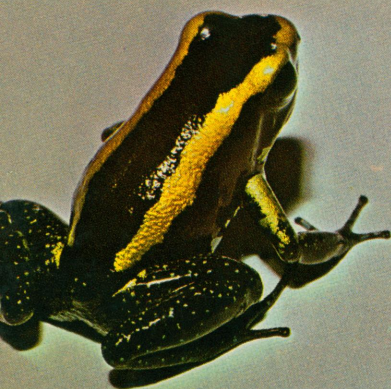
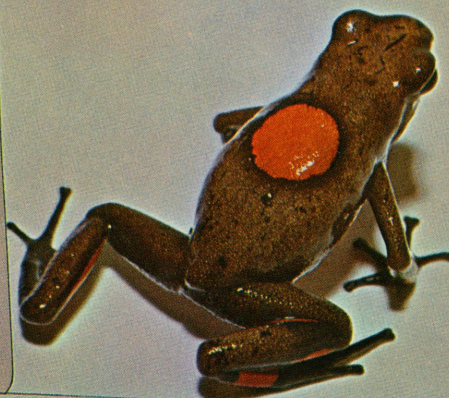


103rd ANNUAL REPORT 1971-72



THE AMERICAN MUSEUM OF NATURAL HISTORY

103rd ANNUAL REPORT/JULY 1971, THROUGH JUNE 1972/THE CITY OF NEW YORK

**THE AMERICAN MUSEUM
OF NATURAL HISTORY**



**ONE-HUNDRED-AND-THIRD 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**

■ The curatorial staff of The American Museum of Natural History maintains and makes available for study collections gathered over a period of 103 years. These artifacts and specimens, which for the most part are irreplaceable, are beautiful and fascinating; they provide the record of the relationship of all living things to each other and to man. They are the foundation of this great natural science institution. Our scientific staff, in collaboration with our Exhibition Department, are responsible for the remarkable dioramas for which we are justly famous. These exhibits have inspired thousands of people to look more deeply into the natural world that surrounds us and controls our destiny.

And so we must recognize that this Museum is an educational institution of the first magnitude serving the City of New York, the United States and the world. With an average attendance of approximately 3,000,000 visitors a year, of whom 2,000,000 are children, the Museum has a strong influence on a large number of people who are—or ought to be—concerned for the future of the world's environments.

Thirty years ago our visitors were largely family groups, parents and children who did not require or expect much in the way of professional educational assistance. Today the Museum is under strong pressure from within and without its walls to teach advanced biology to young people who already know far more about science than most of their elders do and to provide leadership in the ecological education movement. We must also illuminate for urban children their relationship to nature and explain to them the biological quality of human beings and we must point out to everybody the cultural heritage of minority ethnic groups. To do this we are developing a highly skilled Department of Education composed of expert teachers who can draw on the Museum's vast resources and at the same time conduct imaginative experimental programs. Also important are better technological methods to improve visual educational programs. The Museum has been working to develop such methods and we continue to make progress in this field.

In October, with the generous support of the Daniel and Florence Guggenheim Foundation, the Guggenheim Space Theater was opened in what had been the Copernican Hall of the Sun in The American Museum-Hayden Planetarium. This theater incorporates "Astrovision: Sight and Sound in the Round" and gives a new dimension to the



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1. When the Choygal and Gyalmo of Sikkim (right) visited the Museum, they toured the "Costumes of the East" exhibit and saw clothes from their country. At left are Dr. Walter A. Fairservis, Jr., and Mrs. Gardner D. Stout.
2. The 150th birthday of Frederick Law Olmsted, a designer of Central Park, was observed in April. The Museum moved into the park for a day, to present exhibits on the natural history of those 840 beautiful acres.
3. The opening of "Costumes of the East" in October was attended by designers (such as Halston, second from left) and fashion editors. The exhibit was one of the most publicized ones in recent years.
4. Astronaut Walter M. Schirra, Jr., (left) came to The American Museum-Hayden Planetarium to make a film in August. He is shown here talking to Mr. Jeff Sparks (center) and Dr. Franklyn M. Branley.
5. "And Then There Were None," a colorful slide and sound exhibition with a dramatic message, was seen by a large number of Museum visitors. The exhibit's popularity kept it open long after the scheduled closing.
6. Prince Hitachi of Japan (seated), who studies marine invertebrates and birds, visited the Museum in September. In 1960 his elder brother, Crown Prince Akihito, had come to the Museum to see the fish collection.
7. Dr. Robert J. Kibbee (center), Chancellor of The City University, visited the new Animal Behavior facilities. With him in the foreground are (from left) Dr. Thomas D. Nicholson, Dr. Lester R. Aronson and Mr. Gardner D. Stout.
8. Three members of a Soviet group of business and professional women, with their guide, toured the Museum during the year. Here they view the skeleton of *Triceratops*, in the Hall of Late Dinosaurs.



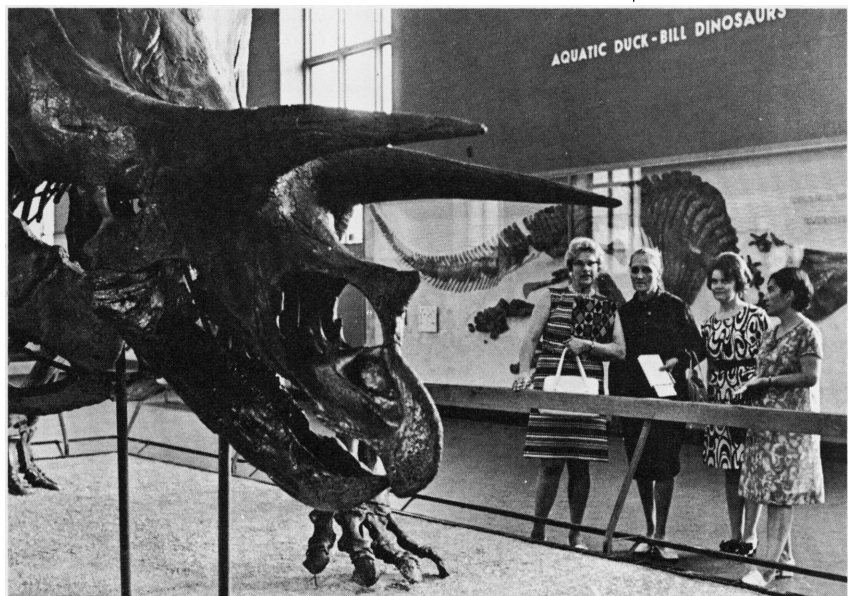
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Planetarium experience. By means of 360° projection the viewer sees six exciting chapters in the story of astronomy and space exploration.

The dedication of the Childs Frick Wing also took place last October, and it signified a landmark in the history of North American vertebrate paleontology. For the first time the world's largest and finest collection of fossil mammals will be made available to science in its entirety. Together with the departmental collection of fossils, the Frick Collection will be arranged on seven well-lighted storage floors. Each floor will have a research area so that large specimens can be studied without being moved from their storage location.

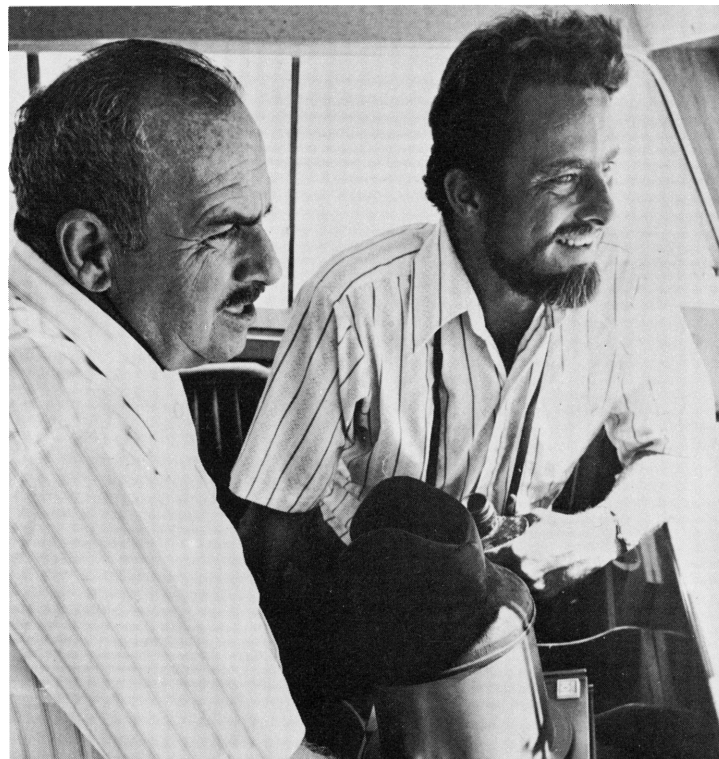
The burgeoning human population and its ominous threat to every living thing is the subject of a dramatic multi-media show that opened on October 27. "And Then There Were None" presents its critical message through slides shown on twelve screens together with four sound tracks of narration, music and animal sounds.

On October 2 we celebrated our second annual West Side Day. Attendance was nearly 20,000, twice that of the first year.

The "Costumes of the East" exhibition was opened in November. Over 100 costumes representative of twelve major cultural areas on the Eurasian continent were displayed and recordings of traditional Asian music were played. This temporary exhibit was conceived in a collaboration between Mr. Joel Schumacher of Henri Bendel and the Department of Anthropology. It portrayed the colorful traditions of Asia, and at the same time emphasized the esthetic loss to the world of the ways of life which the costumes represent.

The much celebrated Auction held in November was an enormous success, thanks largely to the well-organized work of the Women's Committee and the auctioneering finesse of Mr. L. M. Boker Doyle and Mr. Thomas McCance, Jr. The sale of specimens and materials not necessary in the Museum's work brought in \$31,000 and a similar event is planned for the future.

Visits to Asia were in the news this year, and for its part the Museum welcomed a number of distinguished Asian visitors. Prince Hitachi of Japan was here in September, the Chogyal and Gyalmo of Sikkim visited in November, and later that month the delegation to the United Nations of the People's Republic of China used our auditorium to introduce themselves to the Chinese-American community of New York.

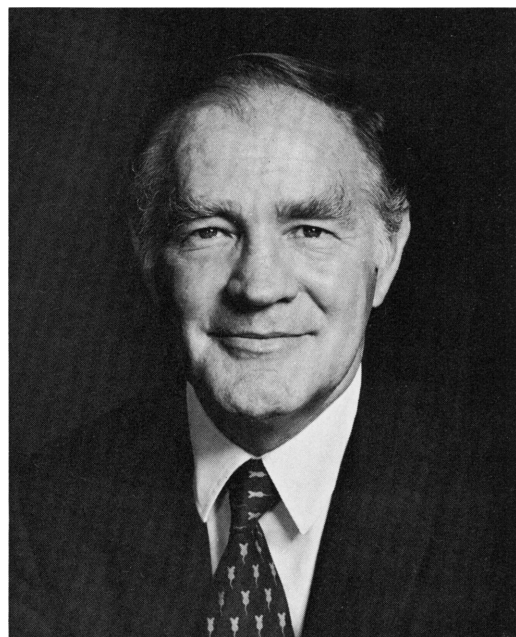


Mr. Benjamin S. Clark retired as Vice-President of the Museum, after having served for four years, and Mr. William T. Golden was elected to succeed him. During the past year three new Trustees were elected: Mr. Nicholas F. Brady, President of Dillon, Read & Company; Mr. Joseph F. Cullman, 3rd, Chairman of the Board of Philip Morris, Incorporated; and Mr. Vernon E. Jordan, Jr., Executive Director of the National Urban League. Mr. James S. Rockefeller was reelected for a five year term. Having served with distinction for many years, Mr. August Belmont, Mr. Richard G. Croft and Mr. Luke B. Lockwood were made Honorary Trustees. Dr. Harold C. Haizlip resigned from the Board when he assumed new duties as United States Commissioner of Education in the Virgin Islands.

Mr. Thomas McCance, Jr., and Mrs. John Macomber are to be congratulated on the devoted and effective leadership which they have provided the Men's and Women's Committees. The fund raising efforts of these Committees have resulted in another record year with \$499,720 raised.

The Volunteer Service in the past year consisted of 175 participants serving a total of 45,165 hours

New faces and a new room: At left, Dr. James C. Tyler was appointed Deputy Resident Director of the Lerner Marine Laboratory at Bimini. He is shown with Dr. Robert F. Mathewson (left), Resident Director, on the "Dan Braman," the Museum's research vessel. At center, the Museum established a comfortable Members' Room for visiting members to use whenever the Museum is open. At right, Mr. David D. Ryus, who was appointed Vice-President, will guide the Museum's development and communications programs.



in nearly every department. They worked at the Information Desks, in the Membership Office, as teacher-guides, in the Orientation Center, in scientific departments, and on special projects relating to fund raising and membership.

The Business Committee for the Arts met at the Museum on March 14, and afterwards they lunched with our Trustees and Staff and took behind-the-scenes tours. This was the first meeting of the Committee to be held in a science museum, and since the event we have received encouraging new support.

Mr. Sidney S. Whelan, Jr., left the position of Vice-President and Executive Secretary; he had applied his outstanding talent and tact to the work of Museum development during the past five years. Mr. David D. Ryus, who has wide experience in publishing and communications, has been named Vice-President. He will work on all phases of Museum development, direct the efforts of the Men's and Women's Committees and generate new sources of support for the Museum. He will also survey the revenue-producing and communications activities of the Museum with a view to making them more

productive and more effective. He will guide the publishing operations of *Natural History Magazine* and the development of the public affairs program.

Mr. Howard L. Clark has volunteered to be the Chairman of a drive to increase substantially the contributions that come to the Museum from corporations. I am delighted that this program will get underway this fall, and I know that Mr. Clark can count on his fellow Trustees for their support.

In past years a small number of corporations have shown interest in the Museum and we are most grateful for the \$73,000 contributed by 32 corporations to the Museum's General Funds in 1971-72. I am confident that the drive that Mr. Clark has so kindly agreed to direct will dramatically augment both the number of corporations that give and the amount of funds that the Museum receives.

Gardner D. Stout, President



Indoors, outdoors, in Museum halls, in laboratories, in classrooms, on the streets—the activity is teaching and the students are absorbed.

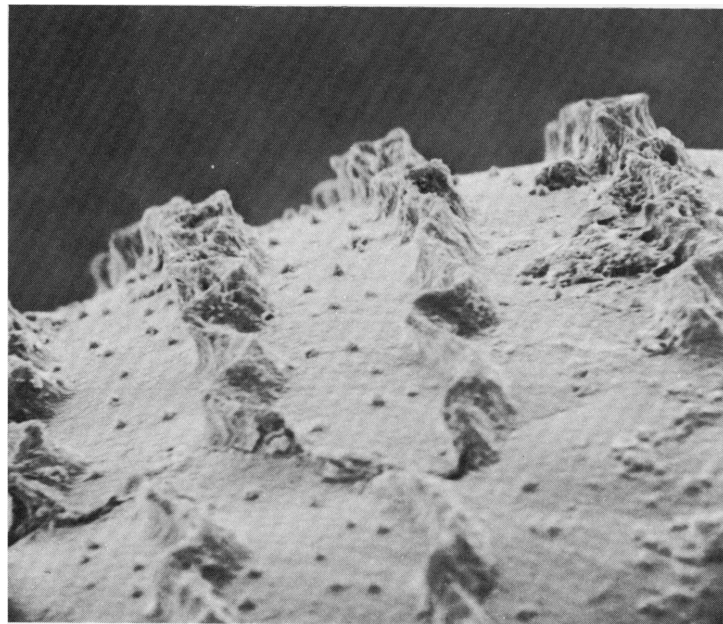


Although The American Museum of Natural History is a science museum and has been engaged in scientific research for over a century, its role as a scientific institution and a rationale for its support of research had never been stated in writing. Such a statement, the Science Policy Report, was prepared this year by the trustees and staff on the Science Policy Committee. After review and criticism by the staff, the Report was adopted by the Board of Trustees at its January 24 meeting. As an expression of Museum policy, the Report serves as a guide to this and future administrations in managing and directing the scientific staff and in allocating the Museum's resources to the support of its scientific activities.

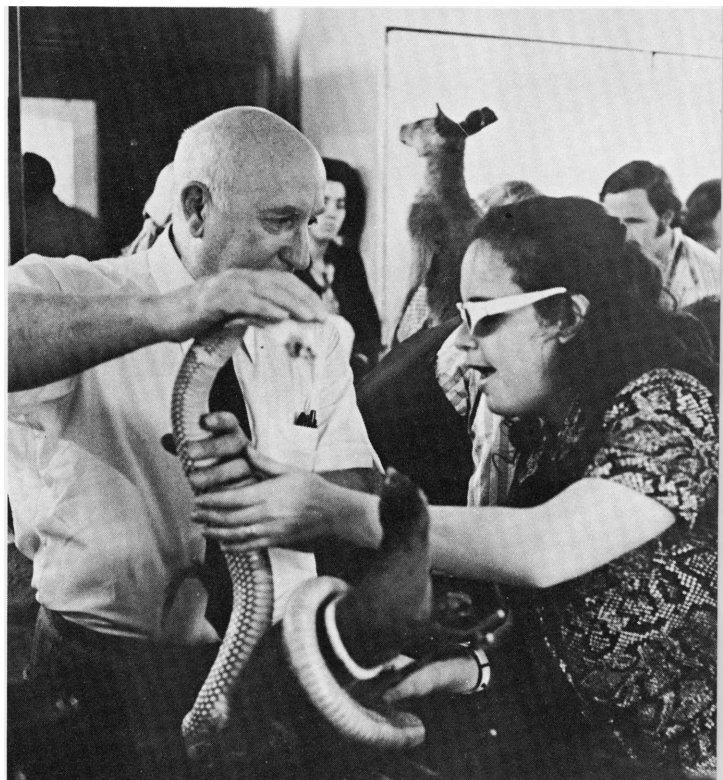
The policy statement affirms positively the Museum's role in basic research in areas in which it is active and for which it is uniquely equipped, largely in systematic zoology and anthropology, but also in geology, astronomy, animal behavior and physiology. Such basic research, according to the Trustees' statement, "... endeavors to answer fundamental scientific and philosophical questions about the nature and diversity of the universe." Recognizing that the scientific staff is "... the keystone of the Museum's reputation, be this reputation global or local, popular or scientific," the Report explains why this is so, and it identifies the responsibility and contribution of its scientists to the four major areas of Museum activity—research, care of collections, exhibition and public education.

Broader participation by the scientific staff in formulating the policies that affect its work, and a greater degree of responsiveness by the administration to the needs and objectives of the staff were the subject of a series of discussions held this year with the Council of the Scientific Staff. These discussions resulted in a memorandum in which I clarified for the staff the duties that Museum scientists were expected to carry out and the priority among those duties that must be given to their research and the publication of research results. The memorandum also reviewed the need for staff participation in evaluating the quality and productivity of its work and for advising the administration on the positive steps that must be taken to realize the highest possible standards in both.

The discussions also resulted in a fundamental change in the membership of the Scientific Council, aimed at making it better able to reflect the interests, activities and problems of the staff as a whole. Traditionally, the Council had been composed of the chairmen of the scientific and education departments,



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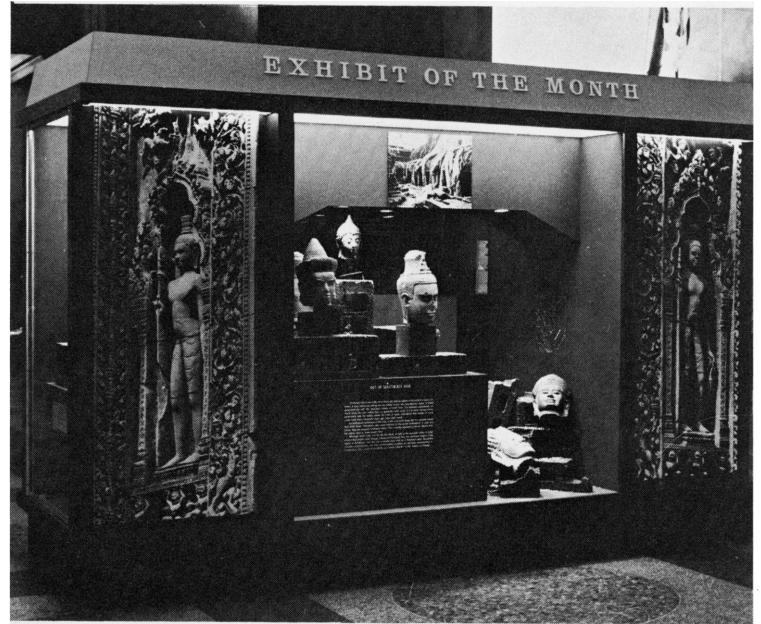
1. It looks like a moonscape, but it is really the shell of *Oxygyrus*, magnified nearly 1000 times. This tiny cannibalistic snail is found in all waters of the world, but it is most abundant in the tropics.

2. Dr. Robert Cushman Murphy told a rapt audience about his days on a whaling vessel many years ago. A film about Dr. Murphy was shown to the Museum's employees, Trustees and volunteers—and their children.

3. Stone heads and bronze figures, representative of the unique art of southeast Asia, were shown as the March Exhibit of the Month. The sculptures provided a preview of the forthcoming Hall of Peoples of Asia.

4. The senior class of the New York Institute for the Education of the Blind attended a behind-the-scenes program. Mr. Hobart M. Van Deusen shows a young woman an exhibit of a cobra and mongoose in battle.

5. The X Seamens Institute brought their lusty songs to the Museum several times during the year. Everyone agreed that sea chanteys sound twice as rousing when sung in the Hall of Ocean Life and Biology of Fishes.



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resulting in a relatively stable body, representative of the more mature elements in our staff and of a group of departments rather than of the entire staff. With the concurrence of the Council, its membership was enlarged by fifty percent through election by the staff of additional members, a procedure that offers to the entire staff the opportunity to be represented in Council deliberations.

Also with the objective of achieving a closer working relationship with and among the curatorial staff, a new position—Deputy Director for Research—was established in the administration this year. Dr. Jerome G. Rozen, Jr., formerly Chairman of the Department of Entomology, accepted an appointment to this post, effective January 1. In his new responsibility, Dr. Rozen supervises the Museum's scientific departments and their personnel, as well as the Museum's field research stations. Through his office, the interests and objectives of the scientific staff will have direct representation in the administration of the Museum.

The Museum's famous collections in zoology, anthropology and mineralogy occupy a central position in much of the research carried out by our staff and by visiting investigators and students who come to us from other institutions in this country and from many other parts of the world. These collections, among the most extensive and scientifically valuable in the world, require care by highly trained technicians and scientific assistants supervised by scientists. The Museum, its Trustees and its staff have no responsibility greater than the care, management, preservation and use in research of these materials.

Specific parts of the collection were designated as a national resource by the National Science Foundation this year, eligible for support by the Foundation in a special program aimed at improving significant biological collections and making them more useful to the scientific community at large. This recognition is a tribute to the efforts of Trustees and staff alike, who, for over a century, have built and maintained these collections in the conviction that they were essential to an understanding of nature and the pursuit of knowledge. The Foundation has awarded grants of substantial funds to the Museum to supplement the resources already available for collection support. The funds, awarded over a five year period, will be used to purchase essential equipment and to employ additional technical and scientific personnel for the curation and maintenance of the collections. Though the Foundation has generously supported the re-

search of our staff for many years, this is the first time that direct support earmarked for the improvement of the collections has been awarded.

Another grant by the National Science Foundation, for the purchase and installation of a scanning electron microscope, is also of great significance to the scientific progress of the Museum. This sophisticated instrument, available now in relatively few institutions of basic research, will greatly advance several research investigations in a number of departments immediately, and will eventually be utilized by a larger number of the scientific staff.

The President, the Board of Trustees and I share a concern for strengthening the quality of the Museum's scientific staff and its work, for increasing the participation of the staff in formulating the policies and programs that affect its members, for raising the level of support our scientific activities receive and for preserving and improving the quality of our collections and the conditions in which they are maintained. The commitment of the Museum's resources to these objectives has been clearly established in the Science Policy Report. Referring to the staff and its role in the Museum's program, the report concludes:

"In summary, research, exhibition, education and the care and preservation of our collections are the elements of the Museum's program, of its status and representation among the great institutions of the world. In all of these, the scientific staff has a vital role. It is essential to our status and reputation, and to each of the elements on which they are based, that the Museum maintain, support and strengthen its scientific staff and the associated resources and facilities on which this staff is heavily dependent."



Thomas D. Nicholson, *Director*

The distinctions and honors bestowed upon the Museum staff during the year included the following:

Administration: Dr. Thomas D. Nicholson, who had served in the previous year as President of The Institute of Navigation, received the Institute's Distinguished Service Certificate in June.

Department of Animal Behavior: Dr. Ethel Tobach was reelected to the Board of Governors of the New York Academy of Sciences. Dr. Howard R. Topoff was elected President of the New York Entomological Society.

Department of Anthropology: Dr. Margaret Mead received the International Kalinga Prize for the Popularization of Science, awarded by UNESCO.

Department of Entomology: Dr. Jerome G. Rozen, Jr. was appointed Adjunct Professor of The City University of New York.

Department of Herpetology: Dr. Charles W. Myers received a three-year appointment at Columbia University as Associate in the University Seminar on Population Biology.

Department of Ichthyology: Dr. Donn E. Rosen became a member of the Editorial Board of *The American Naturalist*, the journal of the American Society of Naturalists. Dr. James W. Atz was appointed Chairman of the Committee to Nominate an Honorary Foreign Member in Ichthyology of the American Society of Ichthyologists and Herpetologists. Dr. C. Lavett Smith was elected a Fellow of the American Institute of Fishery Research Biologists and a Fellow of the Explorers Club.

Department of Living Invertebrates: Dr. William K. Emerson was appointed a Review Editor of *The Naturalist*, the oldest of American journals devoted to malacology. At the annual meeting of the Western Society of Malacologists, he was presented with the Society's award for "Outstanding Contributions to the Study of Mollusca" and the President's Award of Merit. Dr. Dorothy E. Bliss was awarded the honorary degree of Doctor of Science by Brown University at its 204th annual commencement on June 5. Mr. William E. Old was made a Life Member of the Tidewater Shell and Fossil Club.

Department of Mammalogy: Mr. Hobart M. Van Deusen was appointed as consultant to the Survival Service Commission of the International Union for the Conservation of Nature.

Department of Ornithology: A documentary film entitled "And So Ends" concerning Dr. Robert Cushman Murphy's work with whales was produced and featured at a Museum fete honoring Dr. and

Mrs. Murphy.

Department of Vertebrate Paleontology: Mr. Theodore Galusha was elected a Fellow of the Geological Society of America.

Archbold Biological Station: Dr. James N. Layne was reelected President of the American Society of Mammalogists; he served on the Executive Committee of the Florida Chapter of the Wildlife Society, and he was appointed to the Board of Directors of the Florida Foundation of Future Scientists. Dr. A. L. Rand was appointed a Research Associate of the Field Museum in Chicago. Dr. Glen E. Woolfenden was elected to the Council of the American Ornithologists Union for the period 1971-1974.

Lerner Marine Laboratory: Dr. Robert F. Mathewson was awarded the honorary degree of Doctor of Science by Dowling College, Oakdale, Long Island, on May 21.

Staff changes are recorded below, including those effective July 1, 1972:

Dr. Jerome G. Rozen, Jr., was promoted from Chairman and Curator of Entomology to Deputy Director for Research and Curator of Hymenoptera.

Mr. David D. Ryus was appointed Vice-President.

Mrs. Pauline G. Meisler was appointed Controller.

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

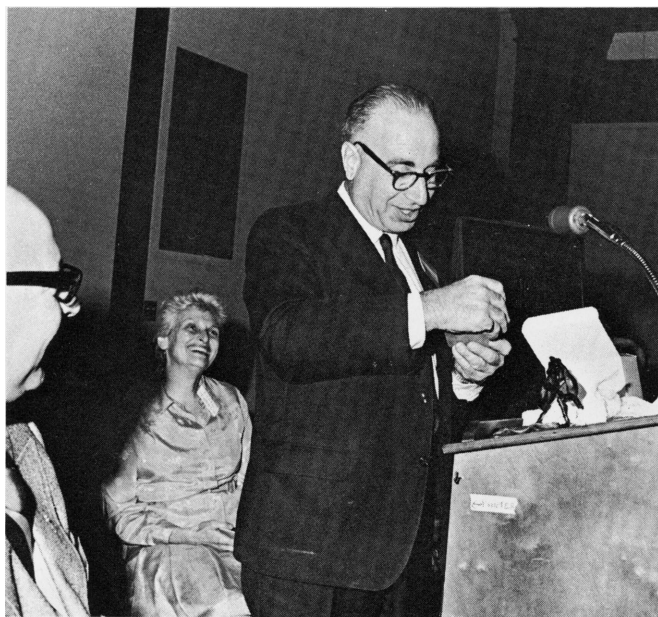
Department of Animal Behavior: Dr. Rene-Guy Busnel was appointed Research Associate and Dr. Carl J. Berg, Dr. John Wayne Lazar and Dr. Peter Moller were appointed Associates.

Department of Anthropology: Dr. David H. Thomas was appointed Assistant Curator of North American Archeology and Dr. Richard A. Gould was appointed Research Associate.

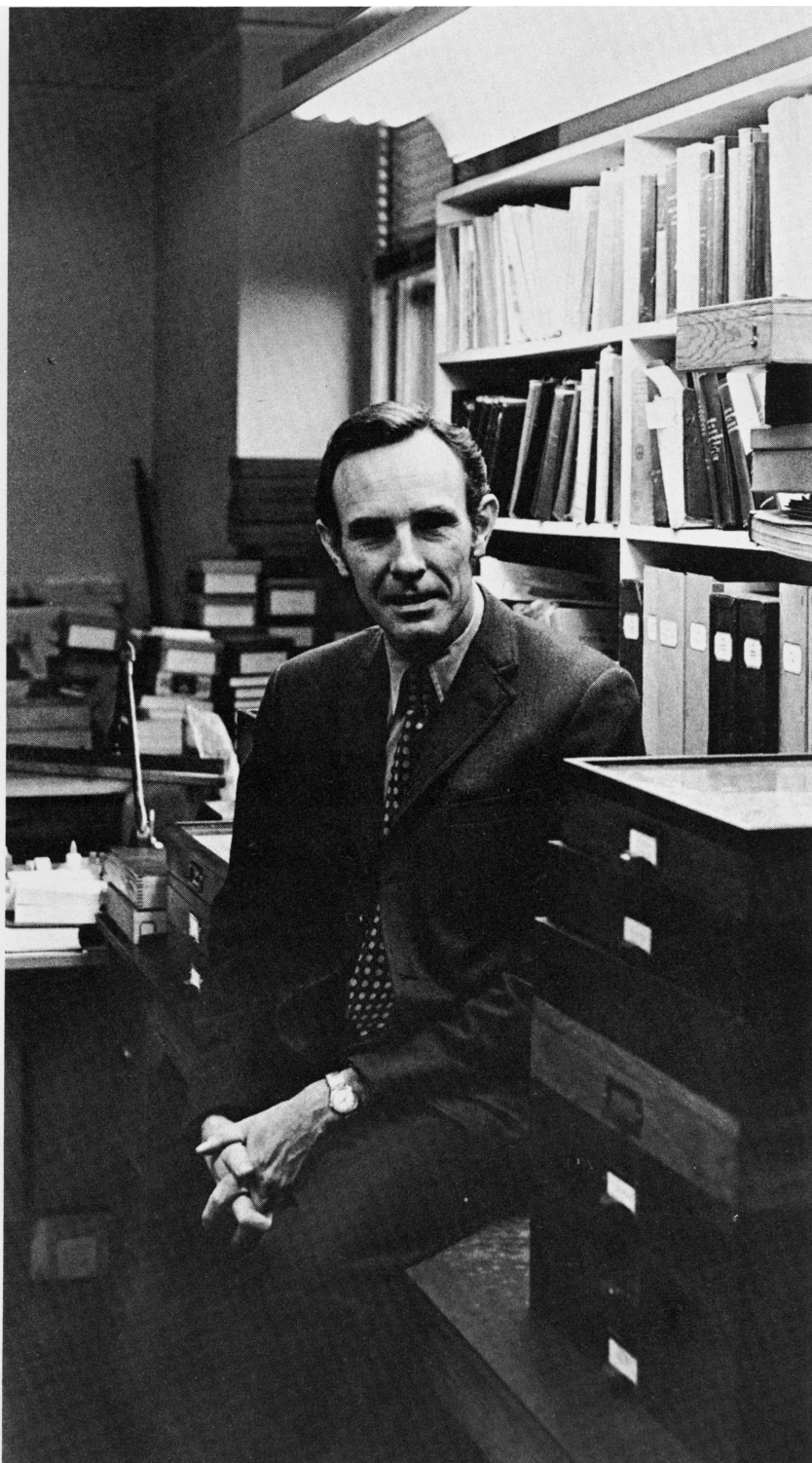
Department of Astronomy and The American Museum-Hayden Planetarium: Mr. James M. Williamson was appointed Business Manager.

Department of Education: Mrs. Barbara Dean Williams Jackson was appointed Afro-American Studies/Coordinator; Mrs. Lucille R. Rios was appointed Assistant to the Coordinator of Caribbean Studies; and Mrs. Maria Uyehara was appointed Caribbean Studies Coordinator; and Miss Karen C. Bennett, Miss Phyllis Mandel, Mr. Mark Soroken and Miss Margaret L. Woods were appointed Museum Instructors.

Department of Entomology: Dr. Lee H. Herman, Jr., was promoted from Assistant Curator to Associate Curator; Dr. Mont A. Cazier was appointed Curator Emeritus, and Dr. F. Christian Thompson was



When the Department of Animal Behavior opened its new laboratories in December, the occasion was also a reminder of Dr. Lester R. Aronson's 25 years with the Museum. His colleagues presented him with a silver tie pin and metal sculpture. In the center picture is Dr. Jerome G. Rozen, Jr., former Chairman of the Department of Entomology and now Deputy Director for Research. At right is Dr. Dorothy E. Bliss, Curator in the Department of Living Invertebrates, who received an honorary doctorate in science from Brown University. The degree was bestowed by President Donald F. Hornig of Brown at the university's 204th commencement in June.



appointed Research Fellow.

Department of Herpetology: Mrs. Carol R. Leavens was appointed Scientific Assistant.

Department of Ichthyology: Dr. C. Lavett Smith was promoted from Associate Curator to Curator.

Department of Invertebrate Paleontology: Dr. Tsunemasa Saito was appointed Research Associate.

Department of Living Invertebrates: Dr. George Schultz was appointed Research Associate and Dr. Penny M. Connell was appointed Research Fellow.

Department of Mammalogy: Dr. John F. Eisenberg, Dr. Alfredo Langguth and Dr. George B. Schaller were appointed Research Associates.

Department of Ornithology: Dr. Richard R. Olendorf was appointed Field Associate and Mrs. Ruth Trimble Chapin was appointed Associate.

Department of Vertebrate Paleontology: Mr. Beryl E. Taylor was promoted from Frick Assistant Curator to Frick Associate Curator and Dr. Robert J. Emry was appointed Research Associate.

In the special activities areas, the following promotions and appointments were made:

Archbold Biological Station: Mr. Fred Lohrer was appointed Scientific Assistant.

Lerner Marine Laboratory: Dr. James Tyler was appointed Assistant Resident Director.

Library: Mr. Tony P. Dominski was appointed Serials Librarian.

Curator Magazine: Miss Rosamond Dana was made Assistant Editor.

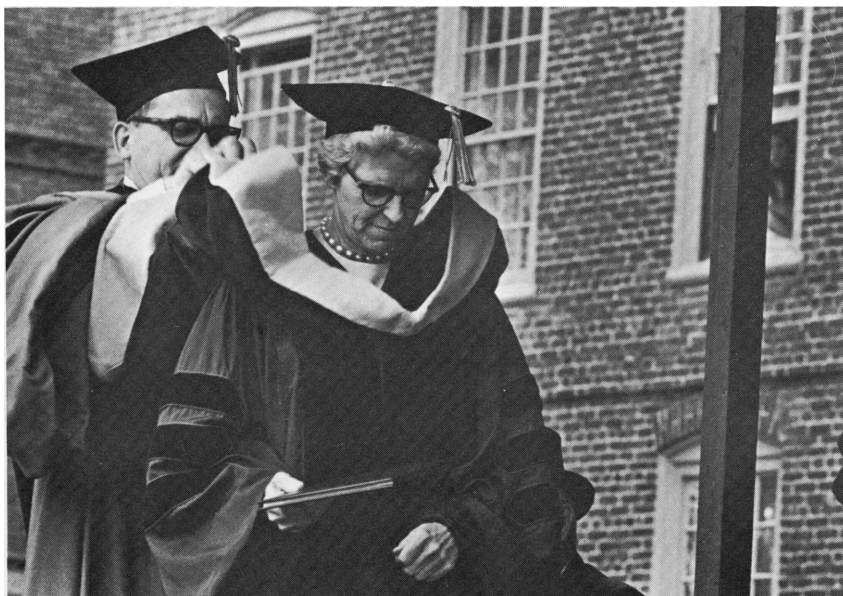
Natural History Magazine: Mr. Alan Ternes was appointed Acting Editor, Mr. John P. Wiley, Jr., was appointed Senior Editor and Miss Rosamond Dana was appointed Book Editor.

In the business and services divisions and offices, the following promotions and appointments were made:

Accounting: Mr. Robert Applebaum was appointed Payroll Manager—Data Processing Operation, Mr. Arthur F. Naylor was appointed Payroll Manager—Social Benefits, and Mr. Richard Gaffney was appointed Assistant to the Controller.

Administrative Services: Miss Shirley C. Brady was appointed Executive Secretary, Mr. John J. Hackett was promoted to Manager, General Services and Mrs. Gillian W. Schacht was appointed Executive Secretary to the President.

Office of Public Affairs: Miss Ann Breen was promoted from Assistant Manager to Manager of Public Affairs, Mr. Arthur L. Grenham was appointed Guest Services Coordinator, and Miss Marilyn Badaracco



was promoted to Assistant Guest Services Coordinator.

Personnel: Miss Joanne D. McGrath was appointed Personnel Manager.

Plant Operations and Maintenance: Mr. Walter F. Koenig was promoted from Staff Architect to Manager of Construction.

It is with deep regret that the deaths of Dr. Leonard J. Brass on September 28, 1971; Dr. Charles Howard Curran on January 24, 1972, and Mr. T. Donald Carter on March 30, 1972, are recorded. Dr. Brass was Curator Emeritus of the Archbold Expeditions in the Department of Mammalogy. A botanist, he led and participated in expeditions to Southeast Asia and the South Pacific—most notably the Archbold Expeditions—during the 1930s and 1940s. He was the world's foremost authority on the plants of New Guinea. Dr. Curran was Curator Emeritus of Diptera in the Department of Entomology. During his tenure at the Museum, he wrote 112 scientific papers and a number of books, both scientific and popular. He made important contributions to the field of economic entomology; however, his major work is considered to be the revision of "Williston's Manual of Diptera," now known as "Curran's Manual." Mr. Carter was Curator Emeritus in the Department of Mammalogy. His work was of great importance in the preparation of the Museum's Asian and African Mammal Halls and the Hall of North American Mammals.



DEPARTMENT OF ANIMAL BEHAVIOR

The new Animal Behavior-Biopsychology Program, a joint venture of the Museum and the Graduate Division of The City University of New York, began full time operations with the opening of its specially designed laboratories at the Museum. The program unites the Department of Biology at City College, the Department of Psychology at Hunter College and the Department of Animal Behavior at the Museum in a common effort of research, teaching and advanced training. Its emphasis is on the development and evolution of animal behavior and on field research. The new laboratories consist of twelve large, well-equipped rooms and other facilities made possible by an award from The Grant Foundation and contributions from The City University and the Museum. A dedication ceremony on December 7 was attended by more than 200 scientists and graduate students from the New York area. Speakers included Dr. Robert J. Kibbee, Chancellor, The City University; Dr. Mina Rees, President, the University Graduate Division; Dr. Fred Elmadjian, Chief, Biological Sciences, Division of Manpower and Training Programs, National Institute of Mental Health, and Dr. Henry S. Odbert, Program Director for Psychobiology, National Science Foundation.

Six professors, eighteen graduate students and numerous undergraduates from The City University are now conducting research in the department along with the regular staff and other students. Among the staff, Dr. Lester R. Aronson is continuing his long-term study of the physiological basis of sexual behavior in domestic cats with a special emphasis this year on the role of the cerebral cortex. It is supported by the National Institute of Child Health and Human Development. Dr. Ethel Tobach is studying factors in behavioral development that are involved in the formation of species. She has been comparing the behavior of four species of desert rodents that mature at different rates. Dr. Helmut E. Adler is continuing his systematic analysis of bird navigation. His research has indicated that orientation is based on multiple cues and that migrant birds probably use the best cues available at any given time. Studying sound production in fishes, Dr. William N. Tavolga has found that some species use sounds at very low frequencies as a type of echolocation, thus gaining information on the presence of nearby obstacles. Working with the

tropical army ant species *Eciton hamatum*, Dr. Howard R. Topoff discovered that its immature young remain in the nest for several days before taking part in daily predatory raids because they are attracted to the chemical odors secreted by the larval brood inside the nest. Dr. H. Philip Zeigler has shown that the physiological mechanisms controlling feeding and drinking in pigeons represent two relatively independent functional systems. Dr. J. Wayne Lazar began a study of the behavior of the European polecat, emphasizing the relationship between fighting and mating as these behaviors develop in the young while they are still dependent on their mothers.

Members of the department had four important books published: "Orientation: Sensory Basis" and "The Biopsychology of Development," both the proceedings of conferences held last year; "Army Ants: A Study in Social Organization," a posthumous work by Dr. T. C. Schneirla, completed and edited by Dr. Topoff, and "Selected Writings of T. C. Schneirla," compiled and arranged by four members of the department.

Lester R. Aronson, *Chairman*

UNDERGRADUATE RESEARCH PARTICIPATION PROGRAM

The Undergraduate Research Participation Program, supported by the National Science Foundation, is now in its thirteenth year. The program gives students the opportunity to enrich their scientific background by working with highly qualified scientists, gaining laboratory and field experiences and doing independent research at the Museum and its field stations.

The interest and enthusiasm evoked by the program has grown continually among Museum staff as well as student participants. This year 254 students applied for positions at the Museum, the Kalbfleisch Field Research Station, the Archbold Biological Station, and the Southwestern Research Station. Thirty-two were accepted, 27 for the summer and five for the academic year. They came from many institutions, such as Michigan State University, University of California, Goddard College, Cornell University, Columbia College and New York University. Research in which they participated resulted in the publication of four scientific papers. Several others are now in press.

Lester R. Aronson

Great Gull Island—An Outdoor Laboratory. The Museum's smallest field station was the subject of an intriguing exhibit. Research into the breeding behavior and physiology of Roseate and Common Terns is the main subject of research at the island.

A model posing among glossy mannequins contributes to the exotic atmosphere of "Costumes of the East."

DEPARTMENT OF ANTHROPOLOGY

The department has many priceless collections, and one of them, containing the colorful and unusual clothing worn through the centuries by the peoples of Asia, was the subject this year of the dramatic exhibit, "Costumes of the East." A highlight of the department's activities, the exhibit was supervised by Dr. Walter A. Fairservis, Jr., and attracted an estimated quarter of a million visitors.

Four other temporary exhibits were opened: Antique Chinese Kites and Art of Southeast Asia, both supervised by Dr. Fairservis; Eighteenth Century Tibetan-Lamaist Temple Banners from Peking, by Mrs. Carin Burrows, and Jade of the Maya, by Dr. Gordon F. Ekholm. Permanent exhibitions in progress include Peoples of South America (Drs. Junius B. Bird and Robert L. Carneiro), Peoples of Asia (Dr. Fairservis), Mollusks and Mankind (Dr. Stanley A. Freed and Miss Michiko Takaki), and the third section of the Hall of the Biology of Man (Dr. Ian M. Tattersall). One of the exhibits in the Hall of Man in Africa was revised by Mr. Philip C. Gifford, Jr. Dr. Harry L. Shapiro is continuing his revision of the heart exhibit in the Hall of the Biology of Man.

An important development of the year was the assignment of new storage areas to anthropology. Adequate storage is necessary to preserve collections and make them available to visiting scholars. A number of significant acquisitions were made, including items of gold from Ecuador and Colombia and the Lester Wolfe collection of Southeast Asian sculpture.

The department was active in research. Dr. Freed and his wife, Dr. Ruth S. Freed of Seton Hall University, studied the relationship of social factors and fertility, using data from a north Indian village. Dr. Freed also continued work on a monograph concerning the effects of urbanization on traditional village life in India.

Dr. Bird spent several months in the Panama Canal Zone searching for evidence of Paleo-Indian occupation of Central America. Dr. Ekholm is continuing his study of pre-Columbian mirrors and the lotus motif in Maya art.

Dr. Carneiro continued to work on a regional ethnology of Amazonia and on his studies of cultural evolution. He has also made a study of the bow and arrow in an attempt to discover when and how this weapon was invented.

Dr. Margaret Mead and Dr. Rhoda Metraux were engaged in field research in New Guinea. They carried out ethnological investigations of the Munduga-





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INDIA AND FASHION
While most would agree India has been the place where the most dramatic changes in style and fashion have taken place, the first century A.D. saw the birth of the modern Indian woman. With the coming of British rule, the Indian woman began to wear the sari, a garment that has become a symbol of Indian identity. Today, the sari is still the most common form of dress for Indian women. The sari is a long, narrow piece of fabric, usually made of cotton or silk, which is draped around the body and fastened with a small brooch or pin. The sari is often decorated with intricate patterns and designs. The sari is a symbol of Indian identity and is worn by women of all ages and social classes. The sari is also a symbol of Indian culture and is often worn during religious and cultural events. The sari is a beautiful and versatile garment that has been a part of Indian life for centuries.



mor and a variety of studies in the Sepik River area.

Dr. Shapiro analyzed demographic data collected in the Marquesas and made a hormone study of the population of Rapa based on 1970 field research. Miss Takaki continued her research on the ecological and ethnographic interpretation of resource management in an agricultural society in northern Luzon. She also began work on the application of descriptive semantics to ethnographic analysis.

Dr. Tattersall studied the subfossil lemuroids of Madagascar. His other research included work on the application of trend surface analysis to paleontological data and investigations on the relationships of early hominids.

Mr. Gifford has almost completed his research on New Ireland art. Dr. Fairservis continued his research on early civilizations, and Mrs. Burrows her studies of Lamaism, Tibetan-Burman languages and the Garuda. Miss Judith Friedlander, an Ogden Mills Fellow, contributed to departmental research with her study of Mexican village life.

Stanley A. Freed, *Chairman*

DEPARTMENT OF ASTRONOMY & THE AMERICAN MUSEUM-HAYDEN PLANETARIUM

The Guggenheim Space Theater, formerly the Copernican Hall of the Sun, was completed and opened to the public on October 5. It was made possible by a gift from the Daniel and Florence Guggenheim Foundation and comprises a round theater with a continuing multi-slide presentation on the history of astronomy through the space age. During his lifetime, Daniel Guggenheim actively supported Robert Goddard, the American rocketry pioneer; thus, the theater is a memorial to both men.

Paid attendance at public and school shows continued to decline, a trend that began during the last fiscal year. Paid attendance this year was 488,850 or 34,913 below paid attendance for fiscal 1970-71 (523,763). This is a decrease of 6.6 percent. An informal survey of planetariums in other parts of the country reveals that most are also experiencing lower attendance. The reasons for the decline are not clear, but it is believed that the general economic condition is a factor.

Lower income resulting from the attendance decline was partially offset by a reduction in employment, including one staff member, one part-time clerk-typist, one technician and one guide-cashier. For all operations, austerity has been the watchword,

and expenditures have been made only when essential. A vigorous national economy is expected to bring the Planetarium's attendance figures up to the previous high level of about 600,000 per year.

The Planetarium obtained a third moon rock from NASA, brought back by the Apollo 12 astronauts; it was displayed in the Theodore Roosevelt Memorial Hall. The education program continued to flourish and was expanded again with the addition of several new courses. Two courses on the history of astronomy that were added on an experimental basis were well received. The Summer Lecture Series for 1971 on "Our Galaxy: The Milky Way" enjoyed good attendance.

The history of space exploration is recounted in an exciting slide-and-sound show in The American Museum-Hayden Planetarium. Visitors sit on the floor inside a circular theater and view the succession of dramas that have led to man's travels in outer space. The Daniel and Florence Guggenheim space theater was opened in October.



A grant of \$16,000 was received from the National Science Foundation for a short course in astronomy to be offered to secondary school teachers in August. Proposals for the support of a community astronomy program and an intern training program have been submitted.

A gift of \$400,000 from the Richard S. Perkin Foundation will make possible the construction of a two-story Perkin Wing between the Planetarium and the Whitney Building. An additional grant of \$50,000 toward the cost of the building extension was made by the Charles Hayden Foundation. The first floor will contain the library and a new shop where items of a high quality will be sold. The second floor will house

the Perkin Hall of the Sun, a comprehensive exhibition on the physics of the sun, the sun among the stars and earth-sun relationships. Construction of the building is scheduled to begin this fall and to be completed next year.

The collection of 24 paintings on astronomy subjects by staff artist Helmut K. Wimmer was shown in Rochester and Chicago and is scheduled to go on to East Lansing and Colorado Springs before being shown at the Benton and Bowles Gallery in New York City.

Franklyn M. Branley, *Chairman*



DEPARTMENT OF EDUCATION

The department continued to present one of the most extensive teaching programs of any museum in the country. In addition to its usual work, Education assumed responsibility for scheduling all school class visits. It was thus possible, by limiting the numbers of classes admitted, to control the atmosphere which, over the years, had grown increasingly chaotic. The opening of a new reception center for classes contributed to the success of this effort.

Teaching programs for schools in New York City reached more than 100,000 youngsters including some 8000 handicapped pupils. Miss Marguerite R. Ross supervised the World We Live In Program in which 25,000 pupils in individual classes have a chance to handle specimens and artifacts normally kept under glass. An auditorium program was attended by another 15,000 students, and 4000 others received guide services. Weekend laboratory courses, supported by a grant from the Louis Calder Foundation, exposed 1000 youngsters to the exciting potential of natural science careers. The Circulating Exhibit Division, under Mr. Carlton B. Beil's direction, supplied loan-exhibits to hundreds of schools. Weekly slide lectures and film programs reached another 16,000 persons.

The department contacted 40,000 junior and high school students through a new visiting assembly program featuring environmental talks by Mr. Kenneth A. Chambers and Mr. Helmut W. Schiller.

The Natural Science Center for Young People, supported in part by a New York Foundation grant, served 43,000 visitors, and 4000 pupils were taught there in scheduled classes. Plans for enlarging and remodeling the Center with a new focus on urban ecology will be implemented during the coming year.

A new People Center, adjacent to and complementing the Natural Science Center, will open in the fall and will offer exhibits, films and teaching demonstrations on cultures of the world.

For the second year, The New York State Council on the Arts supported a Teaching-Intern Program in the exhibition halls. Some senior citizens were among the interns recruited.

A highlight event of the Evening School for Adults Program was a sold-out lecture series by Dr. Margaret Mead. College-level courses for New York teachers were continued. The popular archeology tour to Mesoamerica was again conducted by Mr. C. Bruce Hunter while a new, equally successful geology tour of the American Southwest was led by

Mr. Christopher J. Schuberth. Miss Farida A. Wiley continued her famous nature walks.

Volunteers working with Mrs. Miriam Pineo and Mrs. Marjorie Ransom contributed 17,000 hours of work. In addition to manning information desks, volunteers served as teaching guides and helped staff the new Reception Center for classes.

With the aid of new staff members whose salaries are supported by funds from the Mary Flagler Cary Charitable Trust, a number of special events were held: 2000 persons attended a two-day African music-dance festival; 800 heard an Afro-Caribbean lecture series; over 2000 viewed work created by young black filmmakers, and the Puerto Rican Dance Theater performed for an audience of 800. A program in Spanish for bilingual classes benefited nearly 1000 children. The Museum's first Golden Age Day attracted more than 800 senior citizens. A score of centers for the aged were also visited by department instructors who presented lecture-demonstrations on subjects ranging from Mexican prehistory to early dinosaurs.

Malcolm Arth, *Chairman*

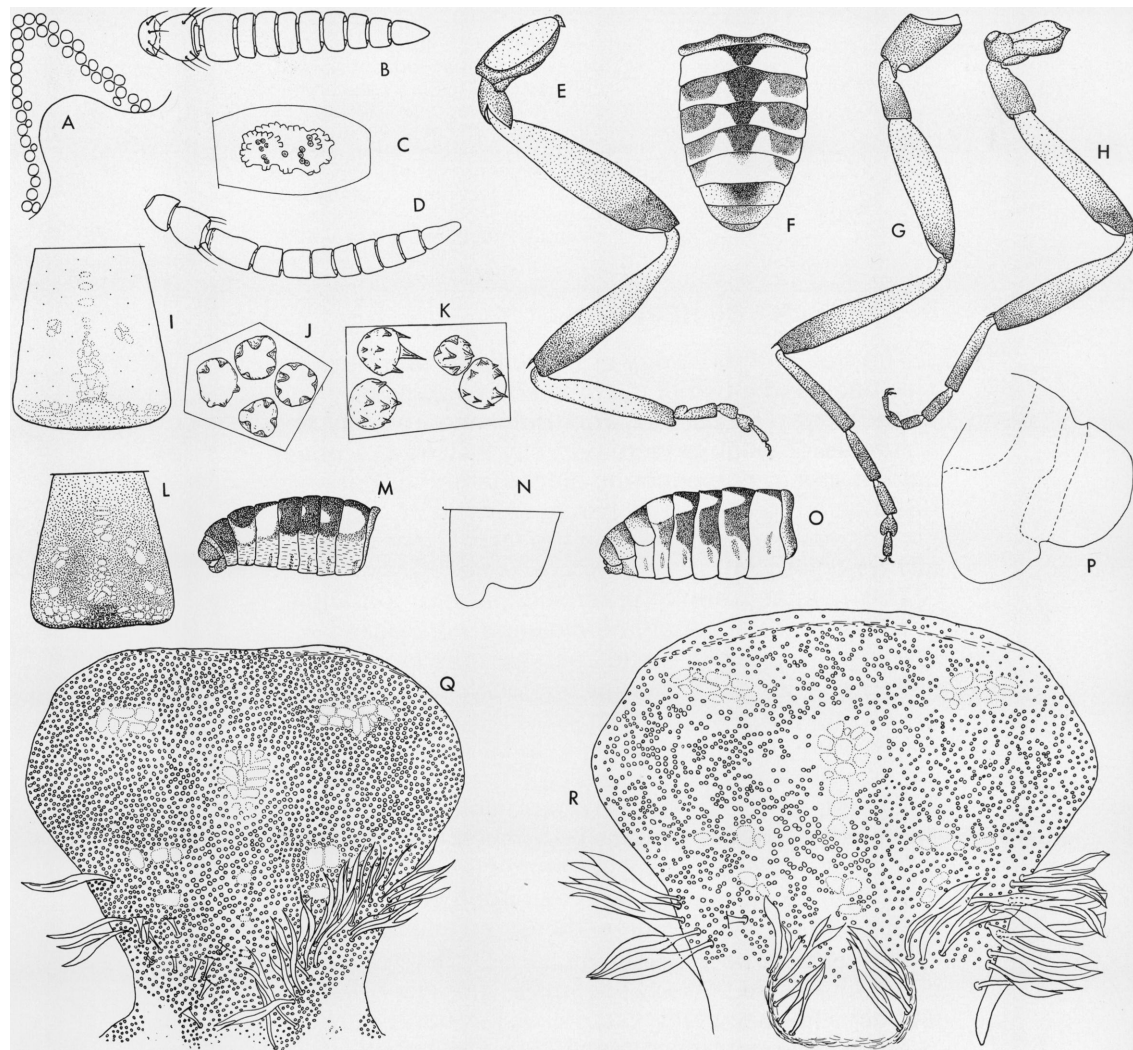
DEPARTMENT OF ENTOMOLOGY

The research activities of members of the department were reflected in the publication of 21 papers on insects and arachnids of the United States and many other parts of the world.

Dr. Pedro W. Wygodzinsky, appointed Acting Chairman in January, continued his work on black flies in collaboration with Dr. Sixto Coscarón. Together they published a review of the southern Andean and Patagonian-Chilean black fly subgenus *Simulium* (*Pternaspatha*) and submitted for publication a review of the prosimuliine black flies of cool and cold temperate Mesoamerica and South America. Dr. Wygodzinsky is also a co-author of a paper on a new assassin bug from Panama, the first member of the subfamily Physoderinae found in the Western Hemisphere. In addition, he published notes on the distribution and biology of *Rhodnius ecuadoriensis*—a "kissing bug"—and the first report of the order Thysanura of St. Helena island in the South Atlantic. On a field trip to the Catskills of New York, he found a new species of black fly belonging to the group never before collected in the eastern United States.

Dr. Jerome G. Rozen, Jr., pursued his comparative

Dr. Pedro W. Wygodzinsky and Dr. Sixto Coscarón have for some years been studying the black flies of cool and cold temperate areas of South and Central America. Their drawings show anatomical details of two species in the black fly genus *Simulium* (*Pternaspatha*). Their report on the taxonomy and distribution of these animals appeared this year in the *Bulletin of The American Museum of Natural History*.



studies of bees. Before assuming his new duties as Deputy Director for Research on January 1, he did extensive field work in Chile where he found a new genus of chilicoline bee. He also discovered three new species of the parasitic bee genus *Kelita*, which had been thought to have only one species, and the nesting sites of *Neofidelia*. The new information on *Neofidelia* has helped Dr. Rozen to near completion of the first paper on the biology and immature stages of this Fideiidae genus. In Chile and Brazil, as well as in the southwestern United States, Dr. Rozen made progress on his long-range study of the subfamily Panurginae.

The systematics of New World geometrid moths continued as the research focus of Dr. Frederick H. Rindge, who completed a revisionary study of the genus *Mericsca* and a study of the Geometridae of the Galápagos Islands. He also pursued his identification of geometrid defoliators of cypress in Colombia. The trees were introduced several years ago by the United Nations for the purpose of reforestation.

Dr. Alexander B. Klots continued his revisionary studies of the North American Crambinae and with his wife, Dr. Elsie B. Klots, produced a popular book

on insects.

Dr. John A. L. Cooke brought forward his research on the urticating hairs of theraphosid spiders, including a detailed study of the hairs of type specimens. He has also studied the medical aspects of these hairs with colleagues at the Nassau County Medical Center. In addition he described the first ricinuleids found on a Caribbean island (Cuba).

Dr. Lee H. Herman, Jr., submitted for publication the first part of his monographic study of the rove beetle genus *Bledius* and completed a revision of the genus *Charhyphus*. On a fifteen week collecting trip to Argentina, he obtained 300 species of Staphylinids.

Dr. F. Christian Thompson studied the hover flies of the family Syrphidae, with special emphasis on the diverse subfamily Milesinae.

The Hall of the Biology of Invertebrates came to completion with the assistance of Miss Alice Gray. Gypsy moths, human lice and selections from the V.G.L. van Someren African butterfly collection were featured in temporary exhibits. The department's collections grew by about 83,000 specimens.

Pedro W. Wygodzinsky, *Acting Chairman*

In this photograph, the scales of the rattlesnake *Crotalus viridis* have been magnified 8000 times by a scanning electron microscope. Dr. Herndon G. Dowling and colleagues at New York University have used electron microscopy to identify various species of snakes; the technique is especially useful when sections of the skin but not whole specimens are available.

DEPARTMENT OF HERPETOLOGY

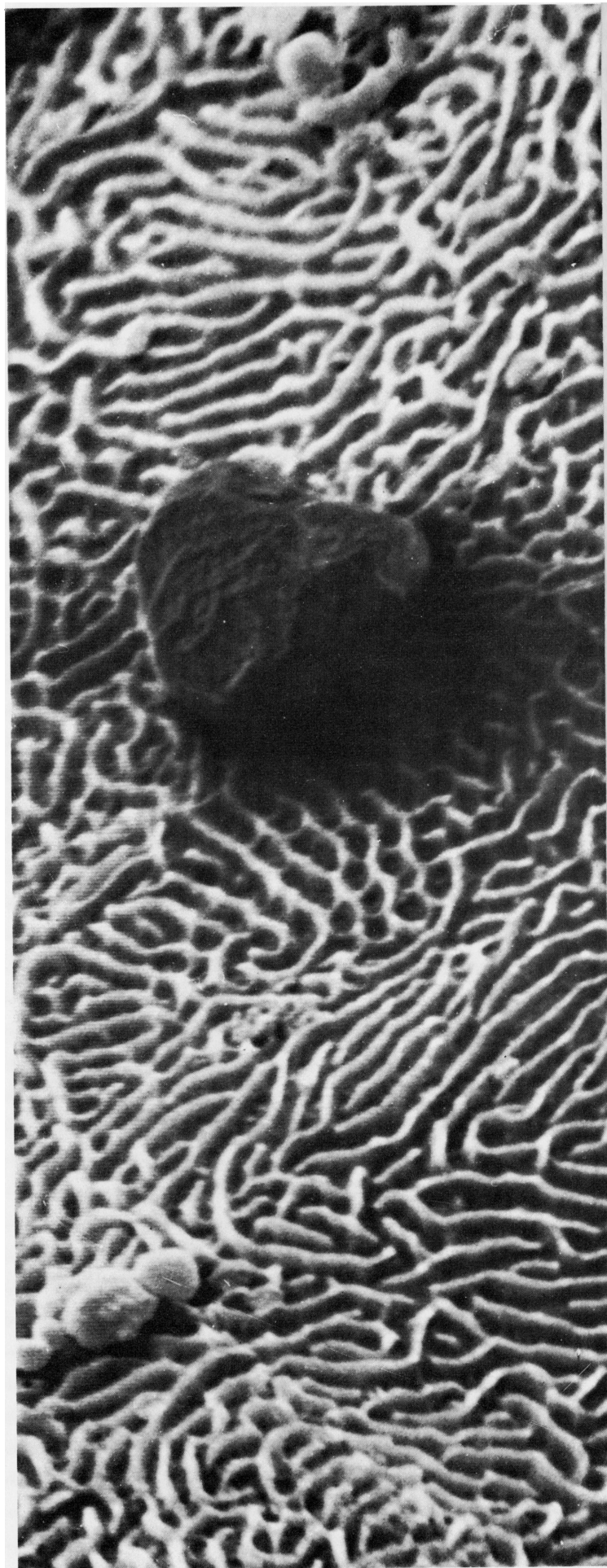
The Hall of the Biology of Amphibians and Reptiles occupied much of the time and effort of the department. The pace of work quickened greatly and a number of exhibits were partially installed. A major habitat group, depicting the giant leatherneck sea turtle on a Florida beach, has been virtually completed, demonstrating—as in the fable—that turtles always finish first.

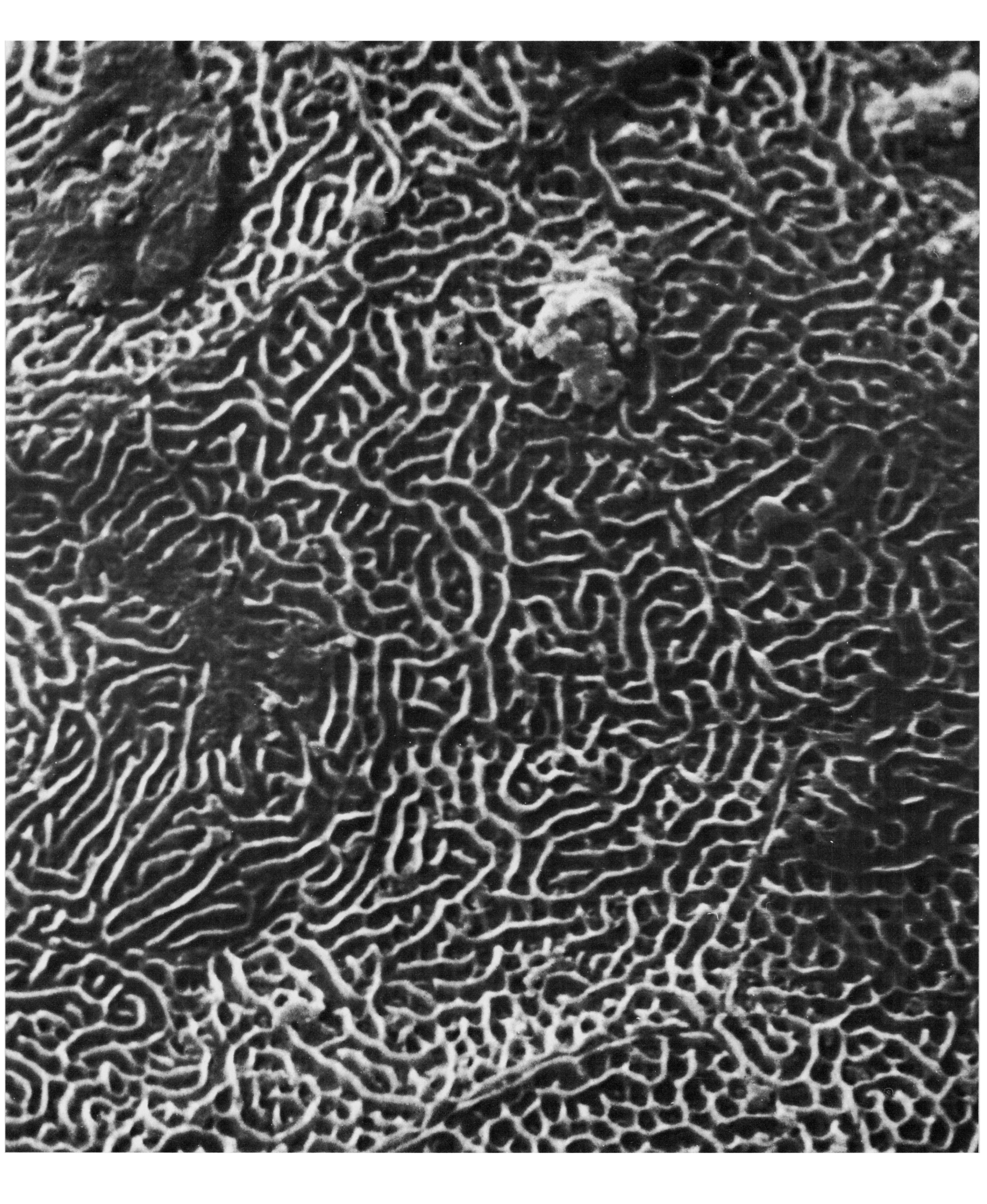
This habitat group required extensive preparation. The turtles are made of fiberglass and were based on plaster models that had been exhibited in the old hall. But since the old turtles had been cast from males and the new group shows eggs being laid, subtle anatomical changes had to be made before the new fiberglass casts could be taken. Photographs and slides were obtained to assure color accuracy, and sand, seashore grasses and beach debris for the exhibit were shipped by truck from Florida. The net result will be a dramatic representation of a crucial part of the life cycle of an endangered species.

Throughout the year, Dr. Richard G. Zweifel was closely involved in many aspects of the new hall. In addition he joined Drs. Charles J. Cole and Herndon G. Dowling on a transcontinental trip to collect amphibian and reptile specimens and on a herpetological survey conducted on St. Catherine's Island, Georgia. The survey indicated that the island is appropriate for long-term ecological studies of such different species as sea turtles, alligators, lizards and newts.

The principal field work of the year was conducted by Dr. Charles W. Myers who, together with Dr. John W. Daly of the National Institutes of Health, made two trips to South America to continue his studies of poison-dart frogs of the family Dendrobatidae. An Exhibit of the Month featuring live specimens of these strikingly-colored frogs occupied a prominent place in the Theodore Roosevelt Memorial Hall. The poisons of these frogs have become fundamental research tools for neuromuscular physiologists and are providing clues to the evolutionary relationships among extremely variable species and ill-defined genera. During a stay in Panama, Dr. Myers initiated a survey of the amphibians and reptiles on the Pearl Islands in the Gulf of Panama.

Dr. Cole continued to expand the department's collection of chromosome preparations, especially those of lizards of the genus *Sceloporus*, which are the subject of his current research. Many pertinent specimens were obtained on his transcontinental trip with Drs. Zweifel and Dowling.





Dr. Dowling directed Herpetological Information Search Systems. This grant-supported organization within the department produces the bi-monthly *Herpetological Review* and performs a variety of other information services.

Curatorial activity included handling almost 7000 specimens newly collected, donated or purchased, and keeping track of the more than 3000 specimens loaned to workers at other institutions.

Richard G. Zweifel, *Chairman*

DEPARTMENT OF ICHTHYOLOGY

The research and activities of the staff again covered many diverse areas. Dr. Donn E. Rosen continued his investigations of the relationships and zoogeography of tropical American freshwater fishes and his study of the higher classification of teleosts. The latter is a phylogenetic analysis of the largest single assemblage of living bony fishes, the Acanthopterygii. The interrelationships of these spiny-finned fishes, numbering 8000 to 10,000 species, are still not clearly understood, but new evidence on the structure of the gill arches suggests that this group may be divided into a few closely related lineages. With Dr. P. Humphry Greenwood and Dr. Colin Patterson, Dr. Rosen also carried out two related projects which indicate the need for reshuffling higher categories of many groups of bony fishes and reassigning numerous previously described fossil forms.

Dr. James W. Atz completed his analysis of the ichthyological literature for the 1969 index of the *Dean Bibliography of Fishes*; he is also nearing completion of the 1970 index. The articles are abstracted and cross-indexed into such categories as the distribution, reproduction and evolutionary relationships of fishes. The information is then stored in a computer system based on more than 8000 different kinds of data. Supported by the National Science Foundation, this project makes a significant contribution to ichthyological research.

Dr. C. Lavett Smith progressed in his work on the evolution of sexual mechanisms in fishes and on his study of the theoretical aspects of community structure, particularly as it concerns coral reef environments. The latter is supported by the Office of Naval Research. As part of the study, Dr. Smith participated in the much-publicized FLARE project (Florida Aquanaut Research Expedition). He and his colleagues remained for extended periods of time at

considerable depths, eating and sleeping in an underwater facility which enabled them to follow the daily activities of both the fish community and individual fishes. For the first time they observed certain activities that had never before been studied during the daytime. Dr. Smith had published and also has in press several papers stemming from his undersea work, and he produced a major revision of Western Atlantic and Eastern Pacific groupers.

Dr. Gareth J. Nelson continued to make contributions to the theory of systematics, a subject on which he has published several papers. He has also undertaken a unique survey of the structure of the lower jaw in all major fish groups. The results have prompted a reexamination of an important Eocene fish fossil, *Phareodus*, which can now be systematically placed with better precision. He has submitted for publication two major works on the Indo-Pacific gizzard shads and on the Recent and fossil pikelike fishes and has sent to press another paper on the gut anatomy of one of the major groups of lower teleostean fishes.

Mrs. M. Norma Rothman collaborated with Dr. Nelson on gizzard shads and contributed to the report now in press. Mrs. Avis H. Rumney worked with Dr. Rosen on a report to be published on a newly discovered synbranchid eel from the Bolivian Amazon.

The department guided the work of six graduate students, five undergraduates and one high school student. Jonathan N. Baskin earned his Ph.D. degree with an outstanding doctoral thesis on a group of minute, parasitic and bloodsucking South American catfishes.

Donn E. Rosen, *Chairman*

DEPARTMENT OF INVERTEBRATE PALEONTOLOGY

The outstanding development of the year was the formulation of a plan for renovating the department's fossil invertebrate collection, which numbers about three million specimens and is used by scientists from many countries to decipher the history of life and systematic changes in past climates and geography. Of these specimens, more than 40,000 serve as published standards for the world's paleontologists. The plan aims at a new inventory as well as greatly increased efficiency in locating and evaluating these research materials, and in communicating information to scholars everywhere.

During the year the staff studied invertebrate

The Museum completed plans to install its own scanning electron microscope in 1972. A number of Museum curators who have been conducting research with scanning electron microscopes at other institutions will be able to develop more comprehensive studies with the new instrument. Below, two examples of electron photomicroscopy from the Department of Invertebrate Paleontology: At left is a chip from a 325-million-year-old fossilized snail, magnified nearly x2000. At right, a living predator snail of the genus *Atlanta*, magnified x200.



evolution and changes in environments of the past. Because of the enormous scope of invertebrate paleontology, which covers more than nine-tenths of all the animals that ever lived, research was concentrated in certain specialties: the mollusks, trilobites and corals. More general coverage for purposes of popular and university education ranged widely over most of the major invertebrate groups.

Research highlights included Dr. Niles Eldredge's completion of a survey of the evolution of many North American kinds of *Phacops*, a Devonian trilobite. This work was coordinated with his interests in modes of speciation and the nature of evolutionary trends in the fossil record. His other work included a study of eye growth in trilobites, and a reconsideration of the interpretation of the human fossil record.

Dr. Roger L. Batten's research on fossil snails has shed light on the post-Paleozoic—early Triassic episode of world extinction, indicating that more genera than were previously known survived the episode. His studies of ultrastructures in molluscan shells as revealed by the electron microscope have shown that revision of some aspects of molluscan phylogeny and classification may be necessary.

Dr. Norman D. Newell published his survey of evolution and changes in geographic distribution of

organic reefs. These help to portray past and present biogeographies and the evolution of world climates. With Dr. Donald W. Boyd, he completed research and a partial manuscript on the world history and evolution of a major group of bivalve mollusks, the Trigoniacea. He also published a monograph on an endemic Permian fauna from southern South America which indicates the existence of a major barrier between Brazil and South Africa at a time when, it had been believed, these lands were united.

The Micropaleontology Press was extraordinarily productive during the year. Under the editorship of Dr. Tsunemasa Saito, the Press inaugurated two new information services to the world's micropaleontologists: a periodical Catalogue of Polycystine Radiolaria and the Bibliography and Index of Micropaleontology. In addition to his editing tasks, Dr. Saito continued research in micropaleontology.

Drs. Newell, Batten, Eldredge and Saito and Mr. Sidney Horenstein hold appointments at several New York metropolitan area universities. They conduct a number of regular courses for students both at the Museum and on campuses.

Norman D. Newell, *Chairman*



A Giant African Snail (*Achatina fulica*) shown emerging from its shell. The Museum had an exhibit on this serious agricultural pest in May. Infestations of the snail, which is approximately the size of a lemon, have plagued Florida since the species was introduced accidentally six years ago.

DEPARTMENT OF LIVING INVERTEBRATES

The rediscovery of *Murex phyllopterus* off the island of Martinique in the Caribbean was one of the highlights of the year. The species was identified by Dr. William K. Emerson as part of his study of the evolution of late Cenozoic marine mollusks from the middle latitudes of the Western Hemisphere. A gastropod, it was originally described by Lamarck in 1822 before its regional origins were known; subsequently it was mistakenly thought to inhabit the Indian Ocean. The fossil record shows that this long-lost species is a surviving descendant of Old and New World precursors traceable through 50 million years of evolutionary history.

Dr. Dorothy E. Bliss, Dr. Penny M. Connell and their co-workers perfected a new method of handling quantitative data on the activity of biochemical factors that control crustacean limb growth; they have also been programming the method for computer processing, and summarizing and analyzing data. So far they have found that there are two limb-growth controlling factors: one inhibits limb growth, the other promotes it.

With other American and European scientists, Dr. Ernst Kirsteuer spent four weeks last summer in Tunisia investigating marine invertebrates. The North African coastal fauna is poorly known at present. Soon, however, this fauna may change because damming of the Nile, resulting in the loss of a freshwater barrier at the Nile Delta, may permit Indo-Pacific species that are invading the Mediterranean via the Suez Canal to migrate to the North African gulfs. Dr. Kirsteuer also continued his studies of the anatomy, systematics and ecology of marine nemertean worms from various parts of the world.

Working with land crabs, Dr. Linda H. Mantel and Mr. Louis Del Giorno, a student at City College, found that tactile stimulation of a crab's limbs by another crab causes the first crab to delay molting. Apparently the tactile stimuli are transmitted through sensory hairs on the crab's walking legs. Dr. Mantel has also continued her studies on neuroendocrine control of salt and water movement within land crabs during the molt cycle.

Both at the Museum and at the Woods Hole Marine Biological Laboratory, Dr. Horace W. Stunkard continued his studies of trematode larvae, particularly *Cercaria nassa*. In other studies, Dr. Stunkard collaborated with Professor Andrew C. Olson of San Diego State College on parasites of birds killed by oil slicks on the Pacific coast.

In addition to research activities, Dr. Emerson

directed the preparation of exhibits on the giant African land snail and on scallops, and Drs. Bliss and Mantel supervised portions of "Invertebrates and the Environment," the final major exhibition installed in the Hall of the Biology of Invertebrates. Dr. Emerson, Mr. William E. Old, Jr., and Mr. Harold S. Feinberg are planning an exhibition of the shells of New York State and a new Hall of Mollusks and Mankind.

Considerable progress was made in curating the collections. Some 35,000 specimens of mollusks and approximately 11,500 specimens of crustaceans were cataloged, along with smaller numbers of specimens in other invertebrate groups. Several important accessions, particularly mollusks, were received. Notable among these is the Jesse H. Webb Collection of 13,000 specimens of shells, including 300 of the 350 living species of scallops, some of which are new to the museum collection.

William K. Emerson, *Chairman*

DEPARTMENT OF MAMMALOLOGY

The wide geographic and scientific perspective of the staff led to field work in Mozambique, Malaya, Thailand and Indonesia, as well as research studies involving every major part of the world. Dr. Richard G. Van Gelder and José Tello, a game biologist, undertook a preliminary study of the biology of nyala antelope in Mozambique. With Mr. and Mrs. Irving Kingsford of Princeton, New Jersey, the investigators marked several of the antelopes while collecting data on their food habits, social structure and mortality factors.

In connection with his study of Australasian rodents, Dr. Guy G. Musser made two trips to southern Asia with the support of the Celebes Fund. On the first he visited collections and made field studies of habitats; on the second he carried out field work in Celebes, where a future field program is planned.

Dr. Sydney Anderson's monograph on the mammals of Chihuahua was seen through the final stages of publication and is expected to appear in the next fiscal year. Dr. Anderson also initiated studies of several species of South American rodents obtained on an earlier expedition to Uruguay and continued his development of improved techniques for systematic studies. Dr. Karl F. Koopman completed the systematic section of his monographic study of Sudanese bats and began a study of the widespread

bats of the genus *Pipistrellus*, especially those of Australasia. Mr. Hobart M. Van Deusen continued his investigations of Australasian mammals and neared completion of the report of the 1964 Archbold Expedition to New Guinea.

Dr. Alfredo Langguth made considerable progress in his study of the wild dogs of South America. Miss Patricia W. Freeman and Dr. Musser undertook a study of the bandicoot rats of southern Asia and also a redescription of the Pliocene fossil mole, *Domnionoides valentinensis*. At the Kalbfleisch Field Research Station, Dr. Van Gelder, assisted by Mr. Donald Straney of Michigan State University, continued his long-term study of small mammal populations.

Concern over the diminishing stocks of wildlife throughout the world led to the multi-media exhibit, "And Then There Were None," written and directed by Dr. Van Gelder. It combines 1458 slides, narration, animal sounds and music to explain the various causes of endangerment. The exhibit "Mammals of New York State," prepared under Mr. Van Deusen's guidance, was opened in the spring. Additional planning for the Hall of the Biology of Mammals continued.

Staff members continued to provide service and leadership to the mammalogy profession. Dr. Anderson edited "Mammalian Species." Dr. Musser served as feature articles editor of the *Journal of Mammalogy* while the entire staff continued to prepare the section on recent literature. They also served as officers, directors and trustees of the American Society of Mammalogists.

Considerable progress was made in reducing the backlog of specimens in preparation and incorporating them in the collections. A grant from the National Science Foundation was received to house the incomparable collection of whales and dolphins and to facilitate service to outside users of the mammal collections.

Richard G. Van Gelder, *Chairman*

DEPARTMENT OF MINERALOGY

Dr. D. Vincent Manson's studies on crustal chemical evolution continue. Igneous rocks, especially those originating or containing inclusions from deep beneath the earth's surface are of most interest. Of note here is a unique suite of diamonds with mineral inclusions currently being documented. Investigation of compositional variations within and among different kinds of stony meteorites continue

as a parallel study. The importance of such materials lies in their representation and the identification of processes operative early in the history of the solar system.

An expedition to Newfoundland in August enabled collection of samples necessary for the completion of a study on the occurrence and significance of an igneous rock suite in Eastern Newfoundland. In February a short expedition to Southern California coincided with the finding of a fabulous pocket of gem tourmaline in a San Diego County pegmatite. A number of valuable specimens were acquired for the collections.

Mr. David M. Seaman continues research on his documentation of the pegmatite minerals of the world. Field trips undertaken by Mr. Seaman in New England and the Midwest were successful particularly in terms of some 200 minerals acquired for the collection.

The number of accessions during the past year increased markedly. Noteworthy was a gift of gem beryls, diamonds and a gold specimen from Mrs. Lincoln Elsworth. Also a gift of Mr. Sidney Singer and Mr. Stephen Singer of large faceted topaz, aquamarine and quartz specimens was greatly appreciated.

Public communication through invited lectures, television and radio appearances and lecture series continues as an important segment of the department's activities.

Preparation of detailed plans and mock-up exhibits for the new Hall of Minerals and Gems continues at an increased pace. This major undertaking demands full participation of all members of the department. The contribution of Mr. Christopher J. Schuberth of the Department of Education is invaluable.

The scientific importance of our holdings results in an increasing demand to supply materials to other institutions and colleagues. This together with some 3000 inquiries from the public for information and assistance, and the routine activities of the Department of Mineralogy provides for an extremely active year.

D. Vincent Manson, *Chairman*

DEPARTMENT OF ORNITHOLOGY

The department was one of three to receive funding from a new five-year program of the National Science Foundation supporting systematic collections as a national resource. The goal is to arrange and curate

Museum scientists circle the globe to conduct expeditions and field work. At right, Dr. Dean Amadon, Chairman of the Department of Ornithology and Lamont Curator of Birds, pauses while on an expedition last winter to the Rio Negro in southern Venezuela to learn more about the elusive Nocturnal Curassow. A major book on curassows by Dr. Amadon and Dr. Jean Delacour will be published by the Museum next year. Below, Dr. Guy G. Musser, Archbold Associate Curator in the Department of Mammalogy, examines a habitat in Celebes, where he is carrying out preliminary investigations for future field work.



the collection of birds in order to maximize its service to scientists and the public. For the task, five curatorial assistants will be employed. The collection is the largest and most complete in the Western Hemisphere.

The completion of the annotated catalog of the Museum's type specimens of birds by Mr. James C. Greenway, Jr., and the continuing curation of the egg collection under the supervision of Mr. Charles E. O'Brien represent preliminary progress in the new program. Mr. O'Brien, who supervises the general collection, received assistance from Mrs. Mary LeCroy and Mr. Allan O'Connell.

Dr. Lester L. Short, Jr., carried out studies of woodpeckers in Okinawa, Malaya, Thailand and India. During the year, five research reports on this group of birds appeared under Dr. Short's name, some in co-authorship with Dr. Walter Bock.

Dr. Wesley E. Lanyon continued experiments with hand-reared Eastern and Western Meadowlarks housed at the Kalbfleisch Field Research Station. He also completed a study of South American flycatchers obtained on his 1971 expedition to Argentina and Brazil, and supervised the doctoral work of three graduate students. They are working in the department under the Graduate Program in Evolutionary Biology, sponsored by the Museum and The City University of New York.

Mr. John Bull completed a book on the birds of New York State. Mr. G. Stuart Keith returned from a year of field work in Africa and Madagascar and initiated a report on the avifauna of Madagascar. He also served as Chairman of the U.S. Section of the International Council for Bird Preservation and as President of the American Birding Association.

"Tibet and Its Birds" by Dr. Charles Vaurie, published by Witherby of London, appeared in May. In preparing his meticulous treatise on the ornithology of this remote area, the author examined all the principal Tibetan collections in museums in the United States and Europe. On a very different subject, Dr. Vaurie is writing a monograph on the ovenbirds (Furnariidae) of South America—a large, varied and taxonomically confusing family.

A volume on another tropical American family, the gamebirds known as curassows, is being produced by the Museum. Its authors are Dr. Jean Delacour and Dr. Dean Amadon. In January and February, Dr. Amadon, accompanied by artist Albert E. Gilbert, joined an expedition to the Upper Río Negro on the Venezuelan-Colombian border, where he obtained

new information that was added to the book.

The department benefited greatly from the services of Dr. Robert Cushman Murphy, Curator Emeritus; Mr. Eugene Eisenmann, Research Associate, and Mrs. James P. Chapin and Mrs. Margaret Stillman, volunteers. Dr. Murphy's lifelong interest in birds and mammals of Antarctica was the subject of a professionally made film first shown May 3 at the Museum.

A revision of the exhibit on local birds was opened in the spring. Dr. Amadon and Mr. Kenneth A. Chambers of the Department of Education worked on the exhibit, which displays 479 prepared skins, mounted specimens and illustrations of birds.

Dean Amadon, *Chairman*

DEPARTMENT OF VERTEBRATE PALEONTOLOGY

Another milestone in the history of the department was the award of a large grant by the National Science Foundation for the preparation, conservation and storage of the combined departmental and Frick fossil mammal collections. These fossil vertebrates, collected over a period of nearly 80 years and numbering 300,000 specimens, are without equal and are regarded as a national resource. Now, for the first time, they will all be made available to research scholars in the new Childs Frick Wing, which has been under construction for the past two years and is close to completion. The building was dedicated in October.

Most department members have been involved during the past year with moving plans. Preparation and renovation of the fossil mammal collections for transfer to the new quarters continued under the direction of Dr. Richard H. Tedford and Mr. Beryl E. Taylor. Mr. Theodore Galusha and Mr. Morris F. Skinner pursued their documentation and curation of the Frick Collection, concentrating particularly on the preparation of stratigraphic reports.

Fishes of the Triassic and Jurassic were the subject of continued research by Dr. Bobb Schaeffer. A Jurassic actinopterygian from Antarctica was described and its affinities to a group of freshwater Australian fishes of the same age were noted. Investigations of North American fishes that lived during the Jurassic in Wyoming and New Mexico are helping to elucidate the origin of the teleosts.

Dr. Malcolm C. McKenna continued to devote much of his time to coordinating a group project on a new mammal classification and to investigating the relationship between plate tectonics and biogeography. He also continued his research on Tertiary

mammals from Wyoming.

Dr. Tedford and Mr. Taylor made considerable progress on their studies of the origin and history of the dog-like carnivores. On a second field expedition to Australia supported by the National Science Foundation, Dr. Tedford made the exciting discovery of new fossil marsupials that will help to explain the diversification of this group on that long-isolated continent. Mr. Taylor contributed to knowledge of the history of North American camels.

Mr. Galusha made additions to his manuscript on large Pleistocene cats from North America based largely on the Frick Collection, in which these animals are superbly represented. Mr. Skinner continued his research on the unique assemblage of fossil horses in the collection.

Dr. Eugene S. Gaffney's extensive study of the turtle cranium in Jurassic to Recent forms is providing significant new insights into chelonian history and relationships. His information is based in part on detailed preparations of Jurassic material borrowed from European institutions.

Renovation of the Osborn Memorial Hall of Late Mammals is now in progress. Dr. Robert Emry, Associate Curator at the National Museum of Natural History, Washington, D.C., joined the department as a Research Associate in February.

Bobb Schaeffer, *Chairman*

SPECIAL ACTIVITIES

ARCHBOLD BIOLOGICAL STATION LAKE PLACID, FLORIDA

Greater understanding of the natural environments in the southern highlands region of peninsular Florida continues to be the primary focus of the station's research program. Major emphasis in these studies is on the ecology, life histories and adaptations of mammals and other vertebrate species, a number of which are endemic forms.

Dr. James N. Layne assisted by Mr. Chet E. Winegarner continued long-term studies of the population ecology of local mammals. In addition, he carried out further investigations of the comparative ecology, behavior and physiology of the cotton

mouse (*Peromyscus gossypinus*) and Florida deer mouse (*P. floridanus*). Dr. Austin L. Rand continued his observations on seasonal aspects of the south Florida biota and a study of the biology of the Purple Gallinule. In his intensive research on the ecology and behavior of the Florida Scrub Jay, Dr. Glen E. Woolfenden obtained further data on production, survival, density and social organization of the population inhabiting the station grounds and adjoining areas. An increasing percentage of the population on the 1500-acre study area is of known age and parentage, which is providing an excellent basis for understanding the evolution and adaptive significance of altruism, group territoriality and other aspects of the Scrub Jay's social system.

Miss Janet Falke, Michigan State University, and Miss Patricia Dolan, Florida Technological University, worked at the station through the Undergraduate Research Participation Program. Mr. John Douglass, Harvard University, and Mr. Tom Price, Duke University, also provided extremely valuable assistance as volunteer workers.

Station personnel gave many lectures during the year and consulted with a variety of individuals, groups and government agencies on environmental problems. Ten publications by members of the staff appeared during the year.

Twenty senior investigators and fifteen assistants from sixteen institutions visited the station. Among the numerous and diversified projects carried out was a study by Dr. Thomas Eisner, Cornell University, of the structural and chemical basis and adaptive significance of ultraviolet wavelength reflection patterns of flower petals and pierid butterfly wings; an investigation of the basis of individual queen recognition by members of a honeybee colony by Dr. Roger Morse, Cornell University, and Dr. Rolf Boch, Canadian Department of Agriculture; an analysis of geographic variation in the vocalizations of the Bobwhite by Mr. Ray Goldstein, a graduate student of the University of Nebraska; and a study by Mr. Warren G. Abrahamson, a graduate student at Harvard University, of the relative roles of vegetative and seed production in plants under different environmental conditions. Fourteen papers based on research done at the station by visiting investigators were published.

For the second time in several years the naturalist staff of the Florida State Parks Division conducted a workshop at the station. Sixty-three individuals, many casual visitors and 28 groups totalling 560 persons

visited the station. As in past years, a number of university groups used the station as a base for ecological studies in connection with regular coursework.

Richard Archbold, *Resident Director*

GREAT GULL ISLAND LONG ISLAND SOUND, NEW YORK

The recent season of work on Great Gull Island was marked by the opening of a special exhibit, "Great Gull Island—A Natural Laboratory," in February. Supervised by Miss Helen Hays, the exhibit shows how research on the biology of terns and other birds that breed on the island is carried out. One section is devoted to the growing number of deformed young terns that have hatched at the station since 1969. The exhibit as a whole recreates the feeling of a real tern colony through the use of 500 origami terns suspended in a flock from the exhibit hall ceiling and of a sound-track featuring bird calls.

Monitoring of the terns for the effects of environmental pollution was continued. Fewer abnormal terns were found than in 1970, but a number of thin-shelled eggs were noted. This is the first time shell-thinning has been observed in tern eggs; it is thought to be caused by the environmental pollutant DDE, a derivative of DDT.

Reports on the abnormal young terns found in the colony in 1969 and 1970 were published by Miss Hays and Dr. Robert W. Risebrough of the Bodega Marine Laboratory, University of California, in *Natural History* and the *Auk*. Dr. Risebrough, an authority on pesticides, has been analyzing Great Gull Island tern specimens for the past two years. The abnormalities resemble those produced in domestic chicks by certain compounds containing chlorine.

The two-year cooperative East Coast Tern Banding Project terminated in 1971. The results showed that during their postbreeding dispersal young terns move both north and south before migrating to their wintering grounds in the Caribbean.

In the last two years facilities on the island have been greatly improved with the addition of a radio, a refrigerator for freezing specimens and an anchored mooring. Mr. Christopher Pineo and other volunteers dug a well to provide a source of fresh water. Mr. Pineo also did several paintings of the island's birds, three of which appear in the special exhibit.

Another volunteer, Miss Sara LeCroy, a high school senior, produced a paper on egg recognition in the Common Tern which placed her in the top 300 of the

Westinghouse Science Talent Search Contest. Helen Hays, *Chairman, Great Gull Island Committee*

KALBFLEISCH FIELD RESEARCH STATION HUNTINGTON, LONG ISLAND, NEW YORK

Long-term projects that have been reported in previous years were continued by nine senior investigators. Eight of these were Museum staff members from six different departments: Drs. Richard G. Zweifel, Donn E. Rosen, Klaus D. Kallman, Richard G. Van Gelder, Wesley E. Lanyon, Lester L. Short, Jr., Max K. Hecht and Jack McCormick. The single non-staff investigator was Dr. Jon Greenlaw, Assistant Professor of Biology at C. W. Post College. No new staff projects were initiated this year.

Noteworthy among the results of research were the successes achieved by Dr. Lanyon in his efforts to breed and hybridize Eastern and Western Meadowlarks in captivity, the fruition of some twelve years of research on a most difficult problem. Hybrids have been produced, some of which are infertile and some of which have bred successfully. Of special note was the successful breeding of a pair of native Western Meadowlarks that had been hatched from eggs artificially incubated and hand-reared in sound isolation chambers.

During the year sixteen students in the Undergraduate Research Participation Program were in residence at the station, where they received practical training in field biology. The program is supported by the National Science Foundation. The students came from the following institutions: Bard College, California State College at Long Beach, City College of New York, Cornell University, Fairleigh Dickinson University, Michigan State University, Mount Holyoke College, Oberlin College, Rutgers University, State University of New York at Geneseo, University of Michigan and University of Nebraska.

The resources of the station were used again this year by three doctoral candidates participating in the Museum's Evolutionary Biology Program, sponsored jointly with The City University of New York. A fourth graduate student, Joseph M. Wunderle, Jr., of the University of Minnesota, returned to resume a study begun while he was a participant in the Undergraduate Research Participation Program of 1969. His work is on the communicatory function of the songs of the Yellowthroat, *Geothlypis trichas*, one of the station's common song birds.

Biology classes from Queens College and York College of The City University of New York took field

Sharks have been the subject of numerous research projects at the Lerner Marine Laboratory. Here Dr. Arland L. Carsten, a Research Associate, focuses a cobalt source on the brain of a nurse shark, in an effort to determine the degree of the shark's protection from forces that, in other animals, can cause severe injury.

trips to the station, and a publication based wholly on station research concerning color variation in the White-throated Sparrow, *Zonotrichia albicollis*, appeared during the year. Three additional manuscripts are in preparation.

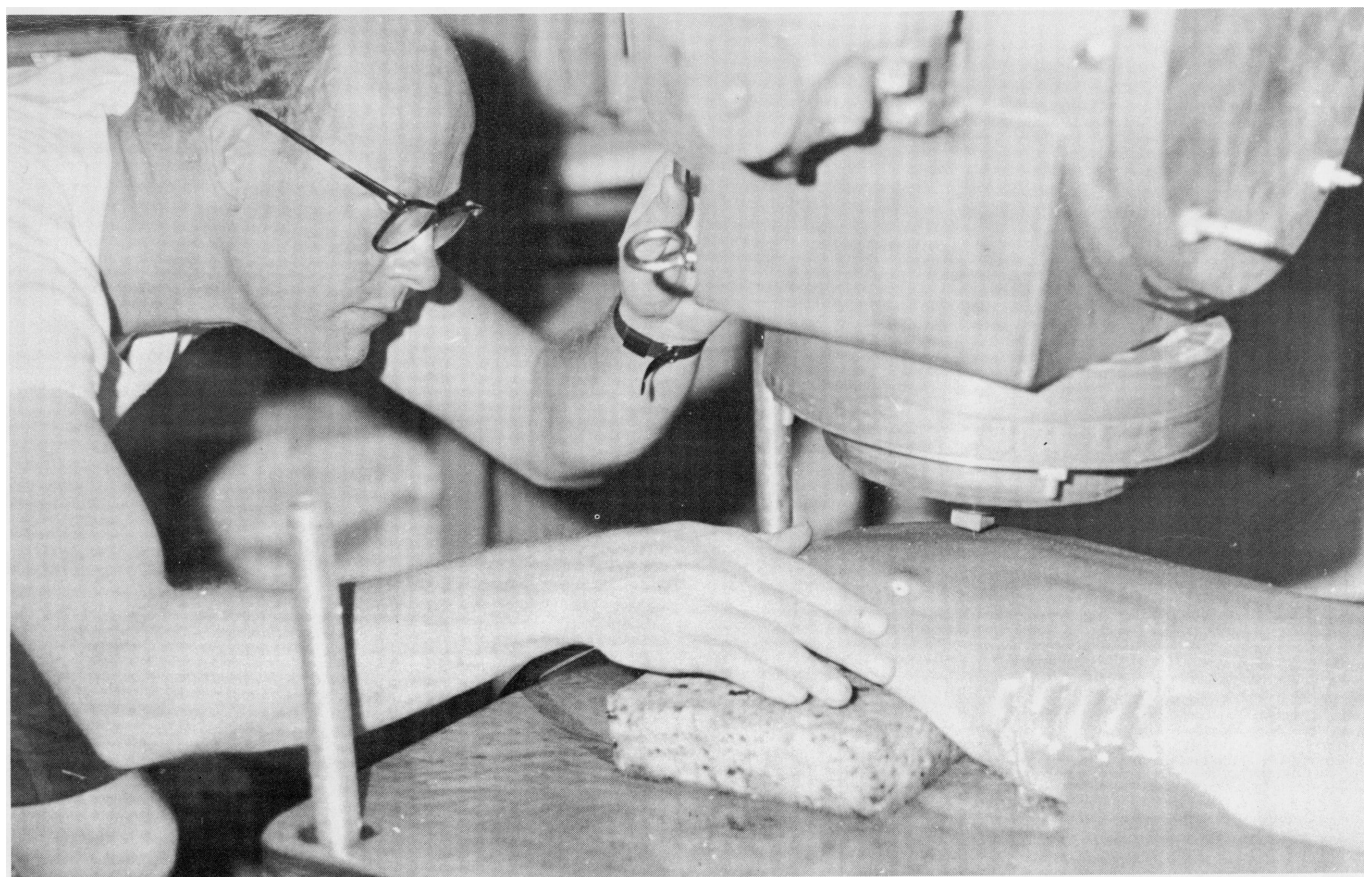
Wesley E. Lanyon, *Resident Director*

LERNER MARINE LABORATORY BIMINI, BAHAMAS

The highest attendance figure to date was achieved with a total of 7281 visitors, or approximately 20 investigators, students and other interested persons per day. In research, the shark was the focus of extensive work. The sensory systems in elasmobranchs, and especially orientation behavior in sharks, continued to occupy the efforts of Drs. Edward S. Hodgson, Arland L. Carsten and Robert F. Mathewson. They are attempting to learn more about how and why behavior persists in response to chemi-

cal stimuli. Through the use of radioactive isotopes, they hope to determine whether stimuli merely pass through the nasal sacs of sharks or whether they are held and metabolized in as yet unknown ways. If stimuli are specifically bound to receptor molecules, this would open the way for interference with the reaction, and might provide hope for blocking it without massive amounts of repellents. Controlling shark behavior is of interest in part because these animals occasionally attack man.

A visiting investigator, Dr. Leon Goldstein, associate professor of biomedicine at Brown University, has been doing a study of urea metabolism in elasmobranchs. He has found that dilution of the marine environment with fresh water produces a marked elevation of urea excretion in the lemon shark, *Negaprion brevirostris*; he is now trying to determine whether the increase occurs at the gills or kidneys.



Dr. I. Kaufman Arenberg of the Department of Otolaryngology and Pathology at Washington University's School of Medicine has continued his study of the inner ear fluid dynamics and pathophysiology in sharks and rays. This work may serve as an experimental model for Ménière's disease in man.

A project of particular interest is being conducted by Dr. H. W. Moeller, assistant professor and marine science coordinator at Dowling College, Long Island, on luminescent organisms. His research has revealed that the incidence of shark attack on lures is significantly increased when the lures are provided with simulated luminescent and randomly flickering lights.

An anatomical and behavioral analysis of vision in the shark, and a study of homogenous I_gM antibody production in this animal are also in progress, along with research on spiny lobster navigation, the biogeology of the Bahamas and blue water plankton of the Gulf Stream. Dr. M. Michael Sigel continued his study of immunology and virology in marine organisms.

For the second year, Dr. Hodgson organized a highly successful, one month credit course in tropical marine biology for college students. Similar but shorter courses were also offered again.

Staff changes included the resignation of Dr. Jerome Wodinsky, Resident Scientist and Lerner Associate Curator, and the appointment of Dr. James Tyler, Associate Curator of Ichthyology at the Academy of Natural Sciences in Philadelphia, as Assistant Resident Director. The well equipped laboratory at the station acquired two additional items: a newly designed salinometer and a refrigerated centrifuge.

Robert F. Mathewson, *Resident Director*

SOUTHWESTERN RESEARCH STATION PORTAL, ARIZONA

The population pressure on the Chiricahua Mountains is becoming more evident. An estimated 60,000 cars now pass the station each year, increasing the number of casual visitors and the potential for disruption of the natural environment of the area. The situation is similar to that confronting many national parks.

The number of guests at the station rose ten per cent overall, with a fifteen per cent increase in scientists and their assistants. A total of 721 researchers and naturalists, their students and families represents an all-time high in a continuing upward trend.

In research, Mr. Vincent D. Roth completed his 10-year identification of local spiders and is drafting a manuscript on the 300 species involved. This year he was assisted by Mr. Albert K. S. Jung from the University of California at Berkeley, a student in the Undergraduate Research Participation Program. Supervised by Mr. Roth, Mr. Jung described a new tarantula from the Chiricahua Mountains and made a preliminary list of tarantulas of the area. Mr. Roth spent two weeks collecting local spiders in the area where the three Mexican states of Chihuahua, Sinaloa and Sonora meet.

Researchers from many universities, colleges and other institutions around the country conducted studies at the Station on a wide variety of subjects. Drs. Albert Vinegar of the University of Michigan and Roger Seymour of the University of California at Los Angeles studied tarantulas and discovered that they do not adapt to varying temperatures. The ability of tarantulas to increase their rates of metabolism was also measured. The results showed that they are not equipped to cope with extended periods of high activity, a finding consistent with their habit of quick

Artistic skills of a wide variety are the mainstay of the Museum's Department of Exhibition and Graphic Arts. At left, an artist paints, scale-by-scale, a mounted 25-foot reticulated python. The original color has to be restored in this way because snakeskins lose their color when removed from the whole specimen. Center, a preparator assembles an artificial philodendron vine for an exhibit in the new Hall of Amphibians and Reptiles which is now under construction. At right, the finishing touches are applied to a mural of Antarctica, which will be the background for the display of Lincoln Ellsworth memorabilia.



but unsustained movement.

Drs. Noel and Helen Snyder of the Department of Zoology at the University of South Florida in Tampa completed their studies of the biology of the Cooper's Hawk, the Goshawk and the Sharp-shinned Hawk. Over a two-year period they devoted approximately 1400 hours to blind observations and studied 60 nests.

Visiting investigators also collected specimens to be observed at home laboratories and studied the life history and territory size of lizards, social behavior in kangaroo and grasshopper mice, altruistic behavior in jays, respiration and osmoregulation in *Scaphiopus* toad larvae and the ecology of water penny beetles.

Ten manuscripts were published by staff members and visiting investigators who did their field work at the station. Recent additions to the insect collection bring the total to about 12,000 individual specimens and 4100 species. The spider collection has gone over the 300 mark and the plant collection is nearing 800 species.

Lectures and slide talks on the station were

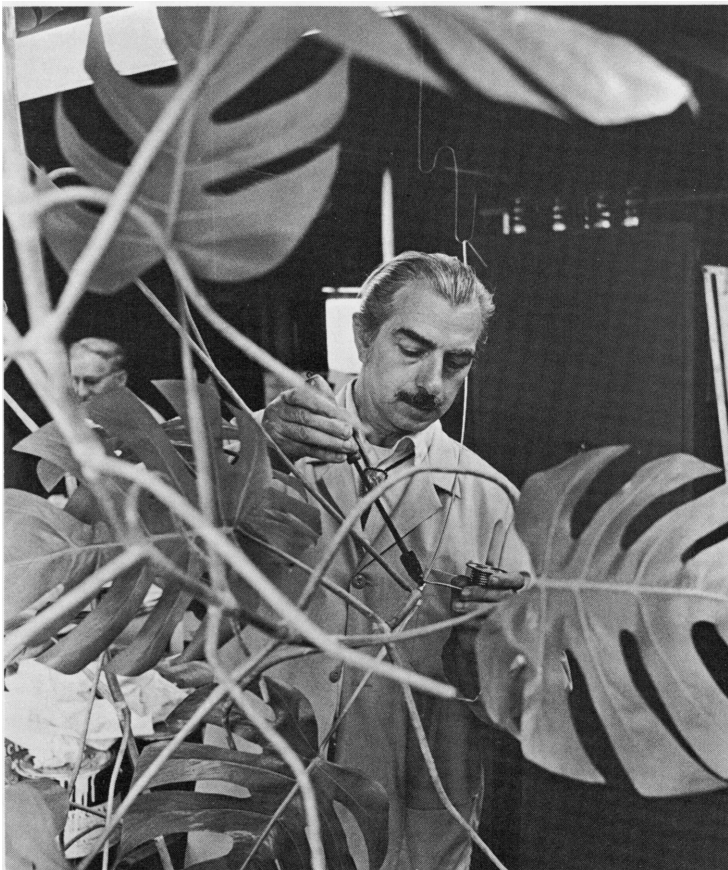
delivered by Mr. Roth to a total of 959 people both at the station and elsewhere around the country. Numerous universities and colleges held classes at the station, collected local specimens and used the laboratory facilities.

Vincent D. Roth, *Resident Director*

DEPARTMENT OF EXHIBITION AND GRAPHIC ARTS

The opening in March of two final sections—"Giant Invertebrates" and "Invertebrates and Their Environment"—marked completion of the complex Hall of the Biology of Invertebrates on which work began a decade ago. While no other permanent exhibition halls were completed during the year, exhibit installation was started in the Hall of the Biology of Amphibians and Reptiles, planned for opening in late 1973.

A number of other projects reached completion and the year witnessed an increase in exhibit renovation and temporary exhibit activity. Reinstallation of the Theodore Roosevelt memorabilia, combined with a new conservation display, opened in October. The exhibits of New York area birds



The popular exhibit on antique Chinese kites remained on view through the summer of 1971. The 18th Century kites were hung from the ceiling of the African Corridor, and their place there was taken later in the year by a flock of paper terns (see page 14).



and mammals, another reinstatement, were finished in April. Revisions to the Sperm Whale and Giant Squid diorama completed the habitat groups in the Hall of Ocean Life. Renovation of the Plains and Giant Koodoo groups concluded the extensive refurbishing of the main floor in the Akeley Hall of African Mammals.

Preliminary designs have been approved for the permanent exhibit, "Mollusks and Mankind," while concurrently installation of "Shells of the New York Area" has been in progress. Approval was also obtained for the revised display of Lincoln Ellsworth

memorabilia, now nearing completion.

The second floor African corridor housed "Antique Chinese Kites," a very popular exhibit which opened in June, 1971, and was succeeded in October by "Arts of the Eskimo," a collection of carvings, prints and artifacts sponsored by ITT Arctic Services and the Arctic Institute of North America. This was followed in February by an ambitious exhibition that eloquently interprets the Museum's field station at Great Gull Island. The exhibition continues until September.

The Corner Gallery, remodeled in early 1971 as a

slide projection theatre, was further adapted for multi-visual presentation of "And Then There Were None" which combines 12-image slide projection, narration, music, song and sound-effects to deliver a forceful message about endangered species. Produced by the Museum and Motiva, Ltd., the exhibit continues into spring, 1973.

In mid-November, an elegant display, "Costumes of the East," opened in the new exhibit area adjacent to the 77th Street foyer. In a dramatic, all-burgundy setting, 113 colorful costumes, many with their stunning jewelry accessories, reflected the former cultures of virtually every Asian region. The exhibit, heavily attended, ran until April 10.

Special exhibits included displays on army ants, an Apollo XII lunar rock and photographs by inner-city high school students. Exhibits of the Month depicted, among other subjects, human lice, tropical arrow-poison frogs, colorful East African butterflies, an infestation of Giant African snails, and ambergris and perfume.

The year also witnessed more participation by the Graphic Arts Division in the designing of special and temporary exhibits as well as greatly increased production of *Natural History* Magazine's promotional material. The division's most noticeable visual impact was through the poster program for providing visitors with directions and other information throughout the Museum's halls and corridors.

Gordon R. Reekie, *Chairman*

LIBRARY

The Library Committee, composed of curatorial staff members, is an advisory and information link between the scientific and educational staff and the Library. In particular this year, the committee helped establish policies aimed at providing more streamlined circulation procedures and better service to scientific and education department staff members.

In order to update and correct the circulation records, which included loans made in the 1920's, an inventory of outstanding loans by individual borrower and by department was begun. An estimated 20 percent of the library materials recorded in the circulation record have been lost. Much of this material is irreplaceable. It is hoped that the new circulation policies and procedures will prevent such loss in the future.

In a reorganization of the internal structure, four Library sections have been instituted: one for selecting and acquiring all Library materials; another con-

cerned with all phases of book cataloging; a third for cataloging serials and maintaining the serial check-in record, and a fourth responsible for stocking and distributing Museum scientific publications. A readers' service section, established earlier, is concerned with circulation, reference and interlibrary loans and was not reorganized.

A volume of the Audubon elephant folios was placed on public display in the Theodore Roosevelt Memorial with the folio pages being turned twice a week. Later, the folio case will be included in the new, rare book room to be installed on the fourth floor.

Functioning as a subject referral center for the New York State Interlibrary Loan Network, the Library was linked to a computer in the State Library at Albany. The computerization, combined with improved interlibrary loan procedures, enabled the Library to fill 85 percent of the State's requests. A \$12,000 State grant for this service was received by the Library.

Geology, paleontology and mineralogy items in the collections were reviewed as part of a continuing project by Mr. Lee Ash, consultant to the Library, and the scientific staff. Discarded materials are being prepared for auction. Four auctions of previously reviewed Library materials which were held at the Swann Galleries brought \$27,199 to the Museum general funds. Grants from the National Endowment for the Arts supported the review of the collections as well as a continuing project to reorganize and update the Library's maps. Several thousand new maps, including a final 690-lb. shipment of U.S. Geological Survey maps, were integrated into the collection. A few thousand duplicates of topographic and geologic maps were donated to James Monroe High School and Hunter College.

The Library served 11,500 readers, circulated 57,765 items, searched 12,906 call slips, answered 9500 reference questions, supplied 22,968 copied pages and received 4106 interlibrary loan requests of which 3070 were filled. Acquisitions continued at a modest rate: 431 books, 114 serial titles and 10,745 serial issues.

Because of staff shortages, the Library has been closed Saturdays since October. No date has been set for resumption of Saturday service.

Miss Nina J. Root was elected to the Executive Committee of the Special Libraries Association Documentation Group. Mr. Tony P. Dominski was appointed Serials Librarian.

Dr. Cyril F. dos Passos made a generous financial gift. Valuable books were donated by Columbia University, the Embassy of Japan, Dr. Paul Cranefield, Dr. Charles Vaurie and Dr. Robert Cushman Murphy.

Nina J. Root, *Librarian*

PUBLICATIONS

The development of a broad program of Museum-sponsored publications continued to show positive results. Negotiations with Doubleday & Company, Inc., were concluded during the year, and a new contract between the Museum and that firm was executed. The contract provides for a continuing partnership in the publication and marketing of the *Natural History* Press series of books, but without restrictions that had formerly limited the Museum's publishing ambitions. While new titles in the series will continue to be published under the joint sponsorship of the Museum and Doubleday, the Museum will develop and produce publications independently or with the cooperation of other agencies.

A book editor was appointed to the *Natural History* Magazine staff during the year, supported by the special publications fund established in 1971. The editor has given much effort this year to the planning, writing and printing of a new general guide to the Museum. This illustrated guide, to be completed in the fall, will make available to visitors an up-to-date, informative and educational supplement to their Museum visit.

A second exhibition catalog, "Costumes of the East," was published in the fall of 1971 for the opening of the Museum's exhibition on that theme. Together with "Ancient Mexico and Central America," published last year, it is being sold in the Museum shop and through *Natural History* Magazine. Other books in development include "Natural History Reader," a collection of anthropological articles from *Natural History*; "Curassows and Related Birds," by Drs. Jean Delacour and Dean Amadon, with color paintings of these South American cracids; and "Portraits from North American Indian Life," a collection of some of the beautiful Indian photographs of E. S. Curtis.

The Man and Nature Lecture Series was resumed in October, under the joint sponsorship of the Museum and Charles Scribner's Sons. The lecturer, Dr. John G. Kemeny, President of Dartmouth College, spoke on the subject "Man and the Computer: A New Symbiosis." A book of the same title will be published by Charles Scribner's Sons in the fall and

distributed to *Natural History* subscribers. Plans for the seventh lecture in the series for next year are being developed by the book editor.

During the year, the Museum and its staff supported or contributed to the publication of other important works of scientific literature. These included:

1. the publication of the posthumous work, "Army Ants," by Dr. T. C. Schneirla, late Curator in the Department of Animal Behavior, which was edited by Dr. Howard R. Topoff, Research Fellow in the Department of Animal Behavior, and published by W. H. Freeman and Company;

2. the publication of "Orientation: Sensory Basis," in the *Annals of the New York Academy of Sciences* (Volume 188) which was edited by Dr. Helmut E. Adler, Research Associate in the Department of Animal Behavior and was based on papers presented at the conference of the same name sponsored jointly by the Academy and the Museum;

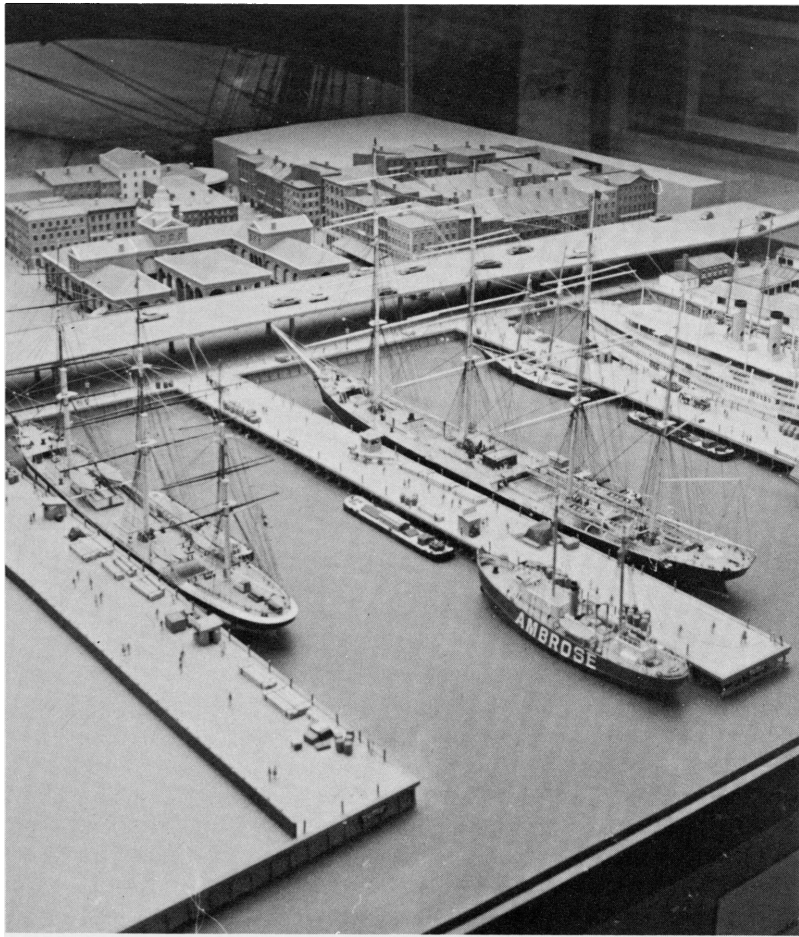
3. the publication of "The Biopsychology of Development," edited by Drs. Ethel Tobach, Lester R. Aronson and Evelyn Shaw, Curators in the Department of Animal Behavior, which was based on the proceedings of the conference of the same title held at the Museum and supported by a grant from the National Institute of Child Health and Human Development, and was published by Academic Press, and the reprinting of "Modes of Reproduction in Fishes," by Dr. Charles M. Breder, Curator Emeritus, and Dr. Donn E. Rosen, Curator in the Department of Ichthyology which was published by T. F. H. Publications.

Thomas D. Nicholson, *Director*

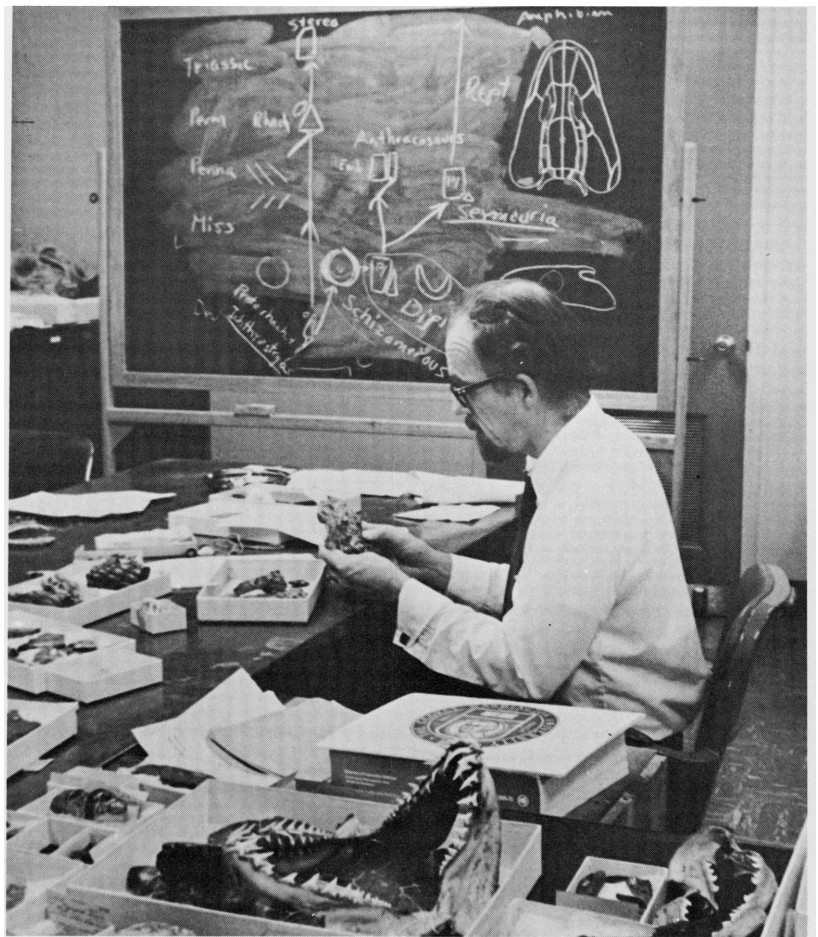
CURATOR

Curator Magazine has completed publication of Volume XIII and one number of Volume XIV. A new assistant editor has been appointed, and future directions for the journal are being discussed. A grant has been received from the Museum Aid Program, administered by the Smithsonian Institution's

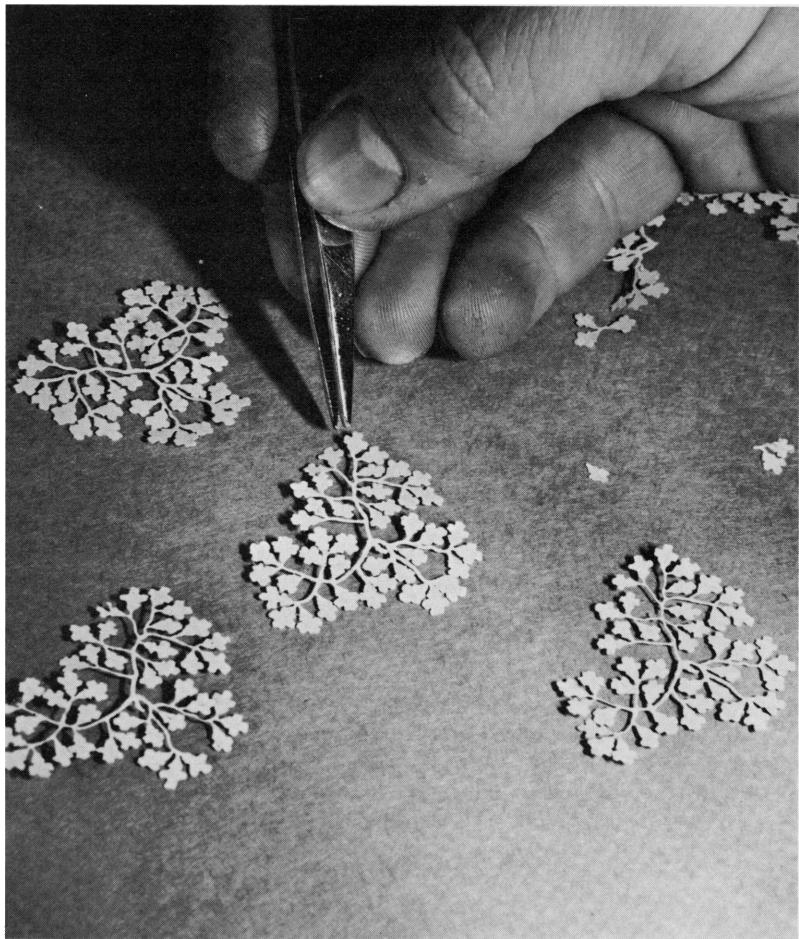
Curator Magazine, published quarterly by The American Museum of Natural History, features a wide variety of subjects of interest to the Museum community. 1. An article on the origins and current status of the new South St. Seaport Museum in New York City was accompanied by this photograph of a model. 2. Another piece, on museums as communications systems, discussed the ways in which curators, designers and writers share important roles. 3. The method for making metal leaves for miniature trees, a process called photofabrication, was illustrated in another *Curator* article. 4. One of several cleaning processes used for ancient or delicate items was illustrated by this photo of a Philippine beaded bag being cleaned safely by a high-speed stream of dolomite particles.



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Because good photographs of lemurs in the wild are difficult to obtain, Dr. Ian Tattersall illustrated his *Natural History* Magazine article, "Of Lemurs and Men," with the beautiful drawings of Madagascar lemurs made a century ago by the French artists Vocaourt and Faquet. The *Propithecus verreauxi coquereli* shown here is a reliable representation of the living animal. The picture was taken from a copy of Alfred Grandidier's "L'Histoire de Madagascar," a valuable property of the rare book collection in the Museum Library.

Office of Museum Programs, to assist in promoting circulation and in reducing the publication backlog.

New subscribers and authors are being solicited actively, and articles of quality and interest are being submitted in greater volume. Other plans include redesigning the journal and introducing new features. With the valuable assistance of the Editorial Board, *Curator* should continue to grow in stature as a forum for all aspects of museology, from detailed techniques to the overall role of the museum in society.

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

NATURAL HISTORY

During a period when many long-established national magazines declined, *Natural History Magazine's* progress was marked by a steady upward curve in circulation and advertising revenue. In contrast to last year's paid circulation peak of 285,000 (itself a gain), the year just ended witnessed a climb to nearly 300,000. Advertising sales rose from the previous year's \$375,473 to a gross revenue high of more than \$575,000.

After a period of difficulty, the computerized subscription fulfillment system has begun to function satisfactorily, with a concomitant falling-off of subscriber complaints. At year's end, the magazine's contract with its new computer service bureau was extended.

With subscription fulfillment meaningfully improved, the magazine will be able to launch a major promotion program this fall. From the computerized data, *Natural History Magazine* will, for the first time, obtain a clear profile of its new subscribers.

Editorially the magazine has increased the number of color reproductions. More of the articles reflect an ecological perspective. And with the recent addition of monthly columns by noted biologists and anthropologists, *Natural History Magazine* is giving vitality to the ideas of science today.

Alfred Meyer, *Editor*

SCIENTIFIC PUBLICATIONS

The Office of Scientific Publications published fourteen articles in the *Bulletin of The American Museum of Natural History* totaling 1309 pages, and 34 numbers in *American Museum Novitates* totaling 864 pages—a combined total of 2173 printed pages.

For the *Bulletin* and *Novitates*, an estimated total of 1200 printed pages is currently in press.

Florence Brauner, *Editor*

OFFICE OF PUBLIC RELATIONS

Through press releases and personal contacts with editors, feature writers, program producers and commentators, Public Relations generated year-round publicity for a wide range of Museum activities. The Auction and West Side Day received excellent coverage. Earth Day '72 was the subject of a five-hour special on WNYC-AM radio, with a number of Museum scientists being interviewed by Dr. Richard G. Van Gelder. Earth Day was also featured on Arthur Godfrey's CBS network radio show.

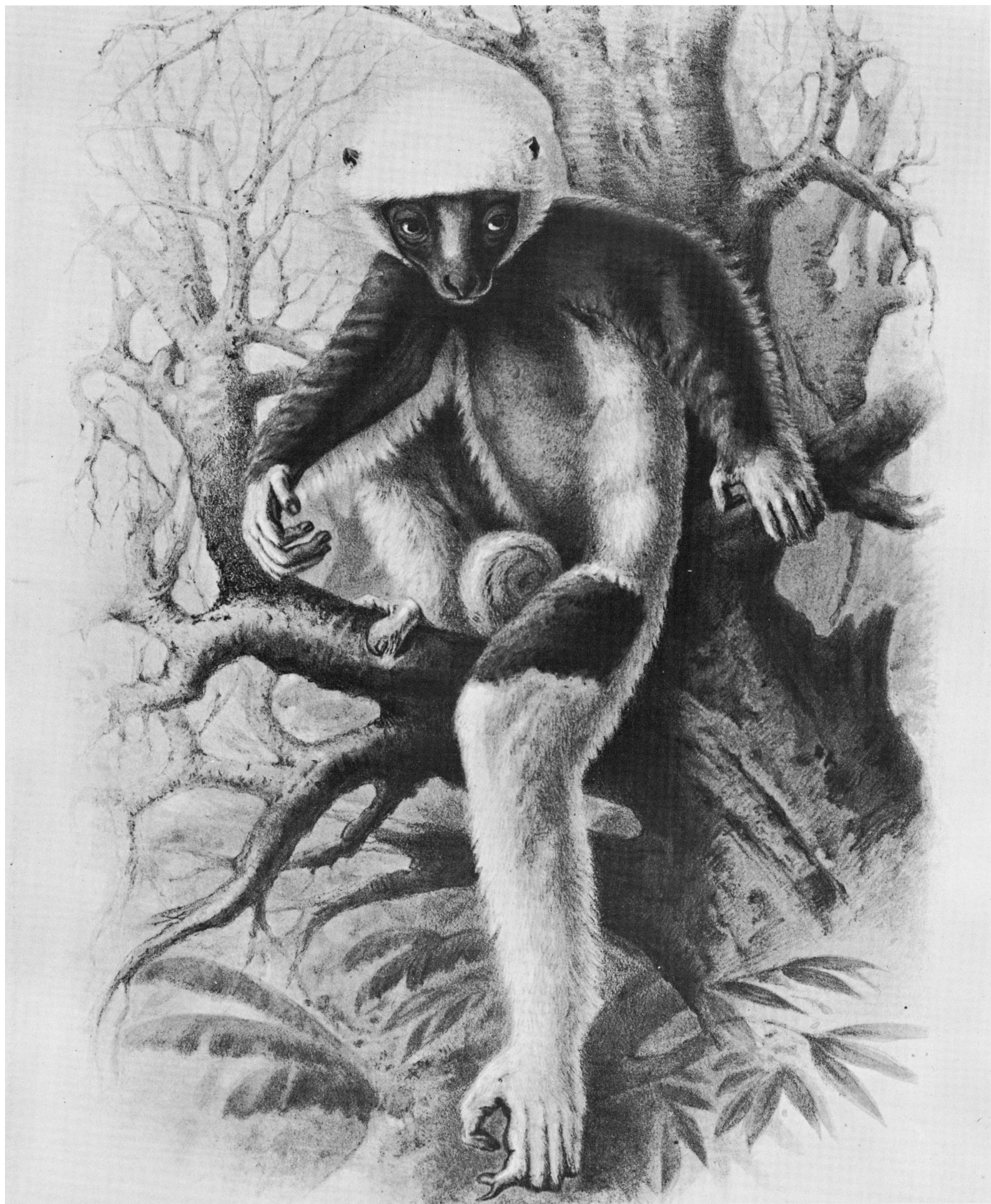
Articles in nearly every issue of *Natural History* and new exhibitions received frequent press attention; "And Then There Were None," "Antique Chinese Kites," a temporary exhibit on human lice, the topical exhibit of Giant Pandas, "Arts of the Eskimo" and "Our Community" all had good local coverage. "Costumes of the East," the remarkable exhibition of Asian dress, was used as a vehicle to introduce the Museum to new groups of friends. Fashion editors, leading American designers and other people who set trends in clothing styles attended the opening party. The affair was covered by the general press and such special outlets as *Women's Wear Daily*.

Museum stories appeared regularly in *The New York Times* and the *Daily News* as well as on local radio and television stations. Area newspapers ran profiles on Museum scientists. Two hundred educational television stations showed a half-hour special on the Great Gull Island exhibition. Westinghouse radio stations in six cities ran a 13-week series based on "Can Man Survive?"

This year, perhaps more than any in the past, the Museum was featured in local magazines and columns. This resulted from a Public Relations program to supply advance information on Museum activities for listing in the "events about town" columns of *Cue*, *The New Yorker*, *New York Magazine*, *The New York Times*, the *Daily News* and many weeklies. Radio stations ran spot announcements on Museum events.

In October, the Museum's new filmspots went to all New York-area channels. Televised on a public service basis at no cost to the Museum, the messages have been "on the air" approximately 1400 times.

Publication of the Annual Report, *Grapevine* and other pieces are among the ongoing concerns of Public Relations. The office also coordinates material for the Museum's posters. It assists in planning and publicizes Exhibits of the Month. It evaluates numerous requests for photographic and film work done



This 10" wood statue of a saint (Santos) was carved in the Philippines by an eighteenth-century craftsman, and is from a collection on sale in the Museum Shop. Visitors to the Shop have the opportunity to purchase from a large collection of artifacts from all over the world.



in the Museum and assists the news media in obtaining information. The office answered an average of 350 letters a month from groups and individuals—many of them children—from every part of the world seeking information on natural history subjects.

Mr. Roberto Rendueles, Manager of Public Relations since 1966, and Miss Anna Montgomery, Manager of Guest Services since 1945, both retired in June. The two offices were combined in a new Office of Public Affairs.

Roberto Rendueles, *Manager*

GUEST SERVICES

Guest Services was the coordinating resource that provided services, facilities, rooms and space for all activities held within the Museum.

From July 1 through June 30 there were 2494 Museum activities and 211 events sponsored by outside groups. In addition to the fourteen scientific societies that regularly hold their meetings in the Museum, the American Astronomical Society and the American Eugenics Society each held three-day conferences here. There were 220 requests for food service in connection with luncheons, coffee service, catered receptions and dinners. On 1340 occasions, films, slides, tape recorders and/or public address systems had to be set up. In addition to these programs, many of them scheduled after regular Museum hours, numerous activities called for the service of electricians when special lighting was needed for photographic work or television and film crews.

Production and distribution of the Museum's bi-monthly Calendar of Events as well as various floor plans were additional responsibilities of the office. The number of calendars mailed or distributed during the year was 108,000. Two hundred and sixty-five thousand floor plans—5000 of them foreign language versions—were part of the year's distribution. Thirty thousand copies of the Calendar supplement, a general information folder, were also given wide distribution.

Thousands of mail and telephone requests for general Museum information were answered. To relieve the pressure of telephone calls, three automatic answering sets, which were installed last year, handled some 7000 general information calls a month.

Anna Montgomery, *Manager*

MEMBERSHIP

A continuing assessment of membership patterns has shown an expected decline in new enrollments due to the increase in fees and numbers of membership categories. At the same time, there was a satisfactory increase in regular renewals. A review of all membership categories, to be conducted later in 1972, will determine which of them will continue or be modified.

Formerly sharing space in the membership office, the members' room is now the exclusive occupant of a large, handsomely furnished lounge located just off the second floor rotunda in the Roosevelt Memorial.

The room, stocked with current reading material for all ages, is open to members, their families and friends every day and during weekends.

Also relocated, the membership office itself moved into refurbished quarters at the north end of a short corridor separating it from the new members' lounge.

Important aid has come from members of the volunteer corps who serve at the desk in the membership corridor greeting visitors, giving information and taking new memberships. They are also deployed at regular information desks in order to handle membership inquiries prompted by Museum placards, referrals by cashiers and other internal promotional measures designed to build membership. Supplementing this effort, a specially-designed, specially-staffed membership booth near the 77th Street entrance has been placed in operation during weekends.

The spring and fall members' special presentations continued to attract good audiences and the introduction of performances by ethnic dance groups was enthusiastically received. Similarly, the Saturday morning programs featuring mime, magic, puppetry and dance have been delighting members' children and other visitors and will be continued.

Marion Carr, *Membership Secretary*

PLANT OPERATIONS AND MAINTENANCE

Modern fluorescent lighting installed throughout corridors, stairwells and basement passageways of the Roosevelt Memorial Building, replaced obsolete, heat-producing fixtures. The more efficient fluorescents have introduced a welcome look of brightness and complement new acoustic-tile ceilings in those areas. These ceilings, also installed in the Hall of the Biology of Man, have greatly reduced noise levels and the same benefit has resulted from new carpeting in the Earth History and Plains Indians halls.

An attractive new Junior Shop in the basement of the Roosevelt Memorial Building was opened in June. In an adjacent area, an automatic coat-checking facility was introduced for the convenience of all visitors. For school classes, still another basement area was constructed to accommodate their cloak-room and luncheon needs. A basement area has been converted into rooms that will function as the Children's Reception Center where school groups will receive orientation talks regarding their Museum visit. The same rooms will also serve as school lunch areas.

Other construction and renovation projects were

launched in a broad program to improve Museum facilities. One of these projects, begun in June, was the creation of a new section on the third floor centralizing all of the Museum's administrative offices. Another, completed in early June, was a complex of suites designed for occupancy by the Contributors' Office and the newly-merged Office of Public Relations and Guest Services. A handsome wood-paneled, acoustic-ceilinged, brightly-lighted corridor now leads past the Natural Science Center to the Education Building's People Center. There renovation was started in June that will result in a fully air-conditioned teaching area with separate acoustically-treated rooms.

The Hall of Late Mammals on the fourth floor was closed to the public in early June for approximately six months. In that period, work will proceed on installation of an acoustical ceiling, carpeting and new lighting. A newly-designed island will make possible more effective exhibition of mammal skeletons.

A specially designed octagonal-shaped information desk was installed on the first floor of the Roosevelt Memorial Building. A duplicate of the desk is planned for the Roosevelt Memorial second floor foyer early in 1973.

Under construction in an area adjacent to the 77th Street Foyer is a gallery of temporary exhibits. It is to be completely air-conditioned and designed to facilitate quick, easy changes of exhibit material.

Old, peeling and hazardous ceiling tile in the Auditorium was removed. The affected areas were repaired and painted in a coordinated effort by personnel from the carpenter, mason and paint shops.

Attractive new passenger cabs and completely automated operation of the 77th Street elevators will result from work done in a Parks Department modernization project contracted for with Raymond Rice and Associates. The new elevators will be in service by summer of 1973.

The Maintenance and Construction Division lost Mr. Rudolf Bonen and Mr. Oscar Wantsy through retirement during the year. Mr. William Heslin was appointed Foreman of the Sheet Metal and Machine Shop.

Frank G. Marmorato, *Plant Manager*

ATTENDANCE

During the year, 2,325,373 persons visited the Museum and 518,056 (including 488,850 paid admissions) visited the Planetarium, making a total attendance of 2,843,429.

ASSETS:

	General Fund
Cash:	
Demand deposits	\$ 27,005
Time deposits	
Receivable from sale of securities	
Accounts receivable, less allowance for doubtful accounts of \$22,182 in 1972	1,043,189
Due from other funds	170,754
Investments in marketable securities (Notes 1 and 2):	
Bonds	
Preferred stocks	
Common stocks	
Total investments	
Planetarium Authority bonds (Note 3)	
Museum shop inventory, at cost	152,650
Prepaid expenses	130,488
	<u>\$1,524,086</u>

LIABILITIES AND FUNDS:

Accounts payable and accrued liabilities	\$ 441,395
Payable for securities purchased	
Due to other funds	
Deferred income, principally unearned subscriptions	1,840,154
Advances from the City of New York	150,000
Funds:	
General fund (deficit)	(907,463)
Special funds (Note 4)	
Endowment funds (Note 5)	
Pension Fund	
Frick Employees Retirement Fund	
	<u>\$1,524,086</u>

BALANCE SHEETS, JUNE 30, 1972 AND 1971

1972				
Special Funds	Endowment Funds	Pension and Frick Employees Retirement Funds	Total	1971 Total
\$ 724,579	\$ 159,491	\$ 152,969	\$ 1,064,044	\$ 922,377
258,637	1,885,000		2,143,637	1,002,961
	334,824	21,849	356,673	937,633
18,245	14,584	13,982	1,090,000	650,210
745,454			916,208	
9,584	17,433,777	4,136,880	21,580,241	21,985,488
	1,156,591	366,169	1,522,760	3,836,287
	31,562,425	7,634,551	39,196,976	35,664,079
9,584	50,152,793	12,137,600	62,299,977	61,485,854
425,000			425,000	425,000
			152,650	143,929
			130,488	128,217
<u>\$2,181,499</u>	<u>\$52,546,692</u>	<u>\$12,326,400</u>	<u>\$68,578,677</u>	<u>\$65,696,181</u>
\$ 358,329	\$ 379,031	\$ 53,743	\$ 799,724	\$ 750,439
	912,498	3,710	432,774	
			916,208	
			1,840,154	1,207,716
			150,000	190,263
			(907,463)	(527,553)
1,823,170			1,823,170	1,513,275
	51,255,163		51,255,163	50,038,769
		11,774,877	11,774,877	12,004,389
		494,070	494,070	518,883
<u>\$2,181,499</u>	<u>\$52,546,692</u>	<u>\$12,326,400</u>	<u>\$68,578,677</u>	<u>\$65,696,181</u>

The accompanying notes are an integral part of these statements.

**SUMMARY STATEMENTS
FOR THE YEARS ENDED**

	<u>General Fund</u>
Balance (deficit), beginning of year	<u>(\$ 527,553)</u>
Additions:	
Appropriation from the City of New York	2,476,543
Gifts, bequests and grants	480,182
Interest and dividend income:	
Endowment funds	1,345,884
Other	18,341
Net profit (loss) on sales of investments	
Visitors contributions (Note 7)	
Contributions of pension fund members and Museum (Note 8)	
Other income (Notes 3 and 6)	423,093
	<u>4,744,043</u>
Deductions:	
Expenditures for:	
Educational activities	2,092,423
Special purposes and objects for which the funds were established	
Payments to pensioners and beneficiaries	
General administrative expenses	1,154,039
Plant operating and maintenance expenses	1,887,135
Pension and other social benefit expenses (Note 8)	578,540
	<u>5,712,137</u>
Transfers between funds	<u>588,184</u>
Balance (deficit), end of year	<u><u>(\$ 907,463)</u></u>

OF CHANGES IN FUNDS
JUNE 30, 1972 AND 1971

1972		Pension and Frick Employees Retirement Funds	Total	1971
Special Funds	Endowment Funds			Total
<u>\$1,513,275</u>	<u>\$50,038,769</u>	<u>\$12,523,272</u>	<u>\$63,547,763</u>	<u>\$61,829,164</u>
			2,476,543	2,635,285
1,798,662	1,284,084		3,562,928	5,166,970
363,196			1,709,080	1,911,444
425		477,693	496,459	580,291
	1,598,168	(140,997)	1,457,171	2,361,954
530,359		6,674	530,359	69,908
			6,674	616,059
457,933			881,026	1,090,877
<u>3,150,575</u>	<u>2,882,252</u>	<u>343,370</u>	<u>11,120,240</u>	<u>14,432,788</u>
			2,092,423	2,258,741
3,445,698			3,445,698	6,045,863
		573,614	573,614	599,198
232,257	93,941	24,081	1,504,318	1,273,493
			1,887,135	1,827,677
146,458			724,998	709,217
<u>3,824,413</u>	<u>93,941</u>	<u>597,695</u>	<u>10,228,186</u>	<u>12,714,189</u>
983,733	(1,571,917)			
<u>\$1,823,170</u>	<u>\$51,255,163</u>	<u>\$12,268,947</u>	<u>\$64,439,817</u>	<u>\$63,547,763</u>

The accompanying notes are an integral part of these statements.

NOTES TO FINANCIAL STATEMENTS

- The Museum maintains its accounts generally on an accrual basis; 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. Purchased investments are recorded at cost and investments acquired by gift, bequest or otherwise are recorded at market valuations at the dates of acquisition.

- Cost and market valuations of investments at June 30, 1972 and 1971 are as follows:

	1972		1971	
	Cost	Market	Cost	Market
Special Funds	\$ 9,584	\$ 10,000	\$ 9,575	\$ 10,000
Endowment Funds	50,152,793	58,537,000	49,012,936	53,375,000
Pension and Frick				
Employees Retirement Funds	12,137,600	13,567,000	12,463,343	13,041,000
Total	<u>\$62,299,977</u>	<u>\$72,114,000</u>	<u>\$61,485,854</u>	<u>\$66,426,000</u>

- The investment in bonds (\$570,000 principal amount) of the American Museum of Natural History Planetarium Authority is carried at cost. The financial statements of the Planetarium, which is operated under the supervision of the Museum's management, are annexed. Interest income of \$25,650 received from the Planetarium in each of the years ended in 1972 and 1971 is included in other income of the general fund.
- The balances at June 30, 1972 and 1971 of special funds (funds which are received or appropriated for specific purposes) is net of overdrafts of certain of these funds of approximately \$217,000 and \$727,000, respectively. These overdrafts represent expenditures in anticipation of transfers from endowment funds or receipt of gifts and grants.
- Endowment funds (including funds functioning as endowment funds) are summarized as follows:

	June 30	
	1972	1971
Endowment funds, income available for:		
Restricted purposes	\$22,909,433	\$22,875,118
Unrestricted purposes	9,014,603	9,012,461
Funds functioning as endowment,		
principal and income available for:		
Restricted purposes	3,464,801	3,440,432
Unrestricted purposes	15,866,326	14,710,758
	<u>\$51,255,163</u>	<u>\$50,038,769</u>

- Other income of the general fund includes the following:

	1972	1971
Natural History Magazine:		
Gross revenue	\$2,524,112	\$1,979,125
Net loss	26,253	104,534
Museum Shops:		
Gross revenue	546,183	512,097
Net income	62,083	74,553

The Natural History Magazine recognizes revenue from subscriptions over the term of the subscriptions. The promotional costs of obtaining subscriptions, which amounted to approximately \$970,000 in 1972 and \$1,060,000 in 1971, are charged to expense when they are incurred. A substantial portion of these expenses represent the cost of a major effort to obtain new subscribers.

- Beginning in April 1971 visitors to the Museum were requested to make a voluntary contribution upon admission.
- Most employees of the Museum have elected to transfer from the Museum's pension plan to The Cultural Institutions Retirement Systems (CIRS) Pension Plan, effective July 1, 1971. In this connection, substantial payments will be made to the CIRS Plan from the Museum's Pension Fund. Payments to persons who retired prior to June 30, 1971 and their beneficiaries will continue to be made by the Museum's Pension Fund.

Pension expense totaled approximately \$400,000 and \$342,000 for the fiscal years 1972 and 1971, respectively. The increase in fiscal 1972 is due to improved benefits and lower employee contributions, partially offset by the City of New York paying certain contributions directly to the CIRS Plan. It is the Museum's policy to fund pension expense accrued.

AUDITOR'S REPORT

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

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY as of June 30, 1972 and the related summary statements of changes in funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the financial statements for the year ended June 30, 1971.

In our opinion, the aforementioned financial statements present fairly the financial position of The American Museum of Natural History at June 30, 1972 and 1971 and the results of its operations for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

Lyzand, Ross Bros. & Montgomery

New York, September 12, 1972.

THE AMERICAN MUSEUM
PLANETARIUM
BALANCE SHEETS,

ASSETS:	1972	1971
Cash:		
Demand deposits	\$ 116,292	\$ 74,418
Time deposits	102,761	2,627
Accounts receivable	4,657	5,040
Inventory, publications and souvenirs, at cost	33,178	25,643
	<u>256,888</u>	<u>107,728</u>
Equipment, fixtures, etc. (Note 1):		
Zeiss planetarium instrument, at cost	221,928	221,928
Less, Allowance for depreciation	30,515	19,418
	<u>191,413</u>	<u>202,510</u>
Furniture, fixtures and equipment	1	1
	<u>191,414</u>	<u>202,511</u>
Buildings, at cost (Notes 1 and 4)	596,136	569,209
Land (donated by the City of New York)	—	—
Deferred expense—space theatre (Note 2)	—	37,000
	<u>\$1,044,438</u>	<u>\$916,448</u>

**OF NATURAL HISTORY
AUTHORITY
JUNE 30, 1972 AND 1971**

LIABILITIES:	<u>1972</u>	<u>1971</u>
Accounts payable	\$ 78,139	\$ 14,870
4½ % Refunding Serial Revenue bonds, past due (Note 3)	570,000	570,000
Accrued interest, past due	<u>315,450</u>	<u>315,450</u>
	963,589	900,320
 CONTRIBUTED CAPITAL, FUNDS AND DEFICIT:		
Contributed capital:		
Charles Hayden	156,869	156,869
Charles Hayden Foundation	379,455	379,455
Perkin Fund (Note 4)	<u>100,000</u>	<u> </u>
	636,324	536,324
Trust Agreement fund	2,500	2,500
Guggenheim Foundation fund (Note 2)	32,001	—
Deficit, as annexed	<u>(589,976)</u>	<u>(522,696)</u>
	<u>80,849</u>	<u>16,128</u>
	<u><u>\$1,044,438</u></u>	<u><u>\$916,448</u></u>

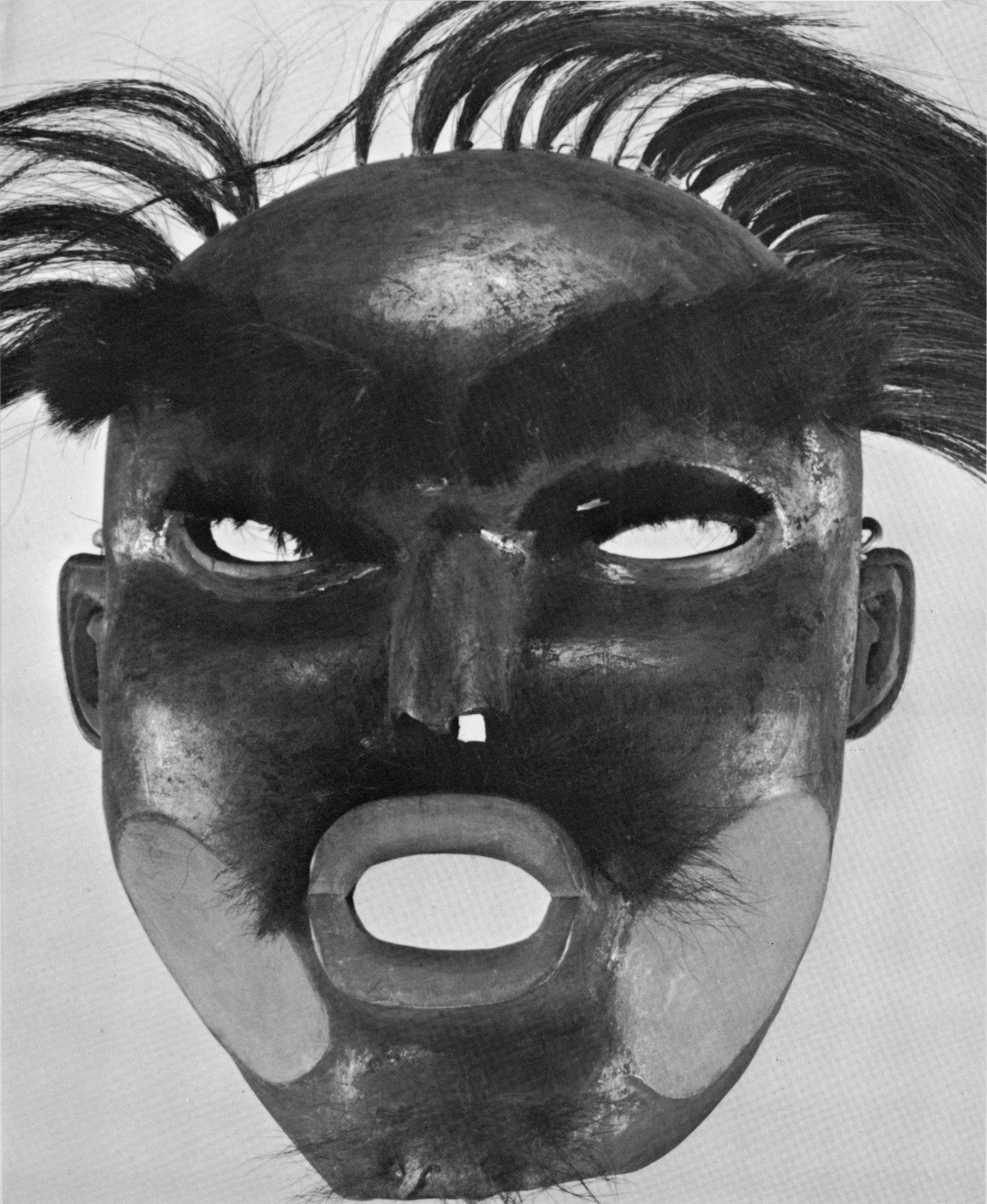
The accompanying notes are an integral part of these statements.

This Kwakiutl Indian mask was collected for the Museum in 1897 on Vancouver Island. Possession of ceremonial masks such as this, which portrays a wild woman of the woods who was believed to carry off children and eat them, was a mark of high rank in Kwakiutl society. The Museum has a large and important collection of North Pacific Coast artifacts from the late 19th and early 20th centuries.

**STATEMENTS OF INCOME, EXPENSES AND DEFICIT
FOR THE YEARS ENDED JUNE 30, 1972 AND 1971**

	1972	1971
Income:		
Admission fees, less allowances and commissions	\$453,835	\$483,192
Auxiliary activity, sales booth	77,965	99,020
Special lectures and courses	30,083	33,923
Miscellaneous	7,498	9,935
Total income	<u>569,381</u>	<u>626,070</u>
Expenses:		
Preparation, presentation and promotional	261,208	264,323
Operation and maintenance	171,240	176,525
Auxiliary activity, sales booth	68,650	77,594
Administrative and general	31,209	26,052
Pension fund, social security and other employee benefits (Note 5)	67,608	44,387
Total expenses	<u>599,915</u>	<u>588,881</u>
Income (loss) before interest and depreciation	(30,534)	37,189
Interest on past due 4½ % Refunding Serial Revenue bonds	25,650	25,650
Provision for depreciation (straight-line method) (Note 1)	11,096	11,096
Net income (loss) for year	<u>(67,280)</u>	<u>443</u>
Deficit, beginning of year	522,696	523,139
Deficit, end of year	<u><u>\$589,976</u></u>	<u><u>\$522,696</u></u>

The accompanying notes are an integral part of these statements.



NOTES TO FINANCIAL STATEMENTS

1. The Planetarium'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 Planetarium 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 a nominal value of \$1. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.

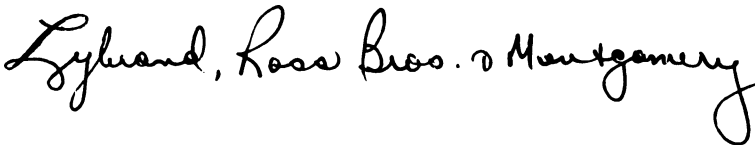
2. In fiscal 1972, the Daniel and Florence Guggenheim Foundation contributed \$188,000 to establish and maintain a space theatre at the Planetarium to replace the Copernican Theatre. Through June 30, 1972, \$155,999 has been expended on this project.
3. The Planetarium Authority bonds were purchased 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. In fiscal 1973, the Planetarium plans to construct a new wing, library and several new exhibits at an estimated cost of \$620,000. This project is to be partially financed by contributions of \$50,000 from the Hayden Foundation and \$400,000 from The Perkin Fund. In fiscal 1972, the first of our four annual installments of \$100,000 was received from The Perkin Fund.
5. All employees of the Planetarium have elected to transfer from The American Museum of Natural History Pension Plan to the Cultural Institutions Retirement Systems Pension Plan effective July 1, 1971. Due principally to improved benefits and lower employee contributions under the latter plan, pension expense increased from \$16,229 in 1971 to \$38,877 in 1972. It is the Planetarium's policy to fund pension expenses accrued.

AUDITOR'S 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, 1972 and the related statement of income, expenses and deficit for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the financial statements for the year ended June 30, 1971.

In our opinion, the aforementioned financial statements present fairly the financial position of The American Museum of Natural History Planetarium Authority at June 30, 1972 and 1971 and the results of its operations for the years then ended, in conformity with the accounting principles referred to in Note 1 applied on a consistent basis.



New York, September 12, 1972.

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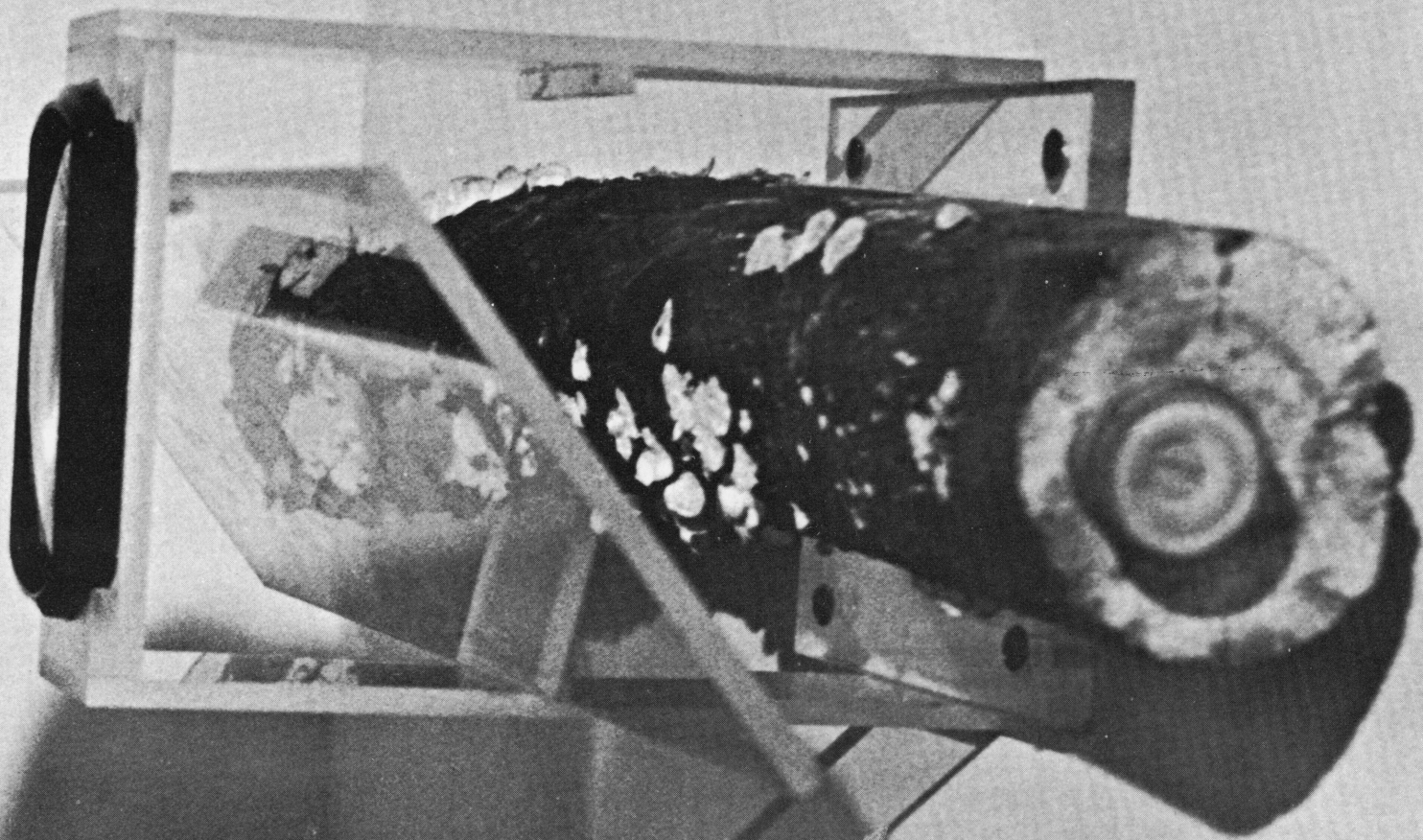
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The trees in Central Park—like trees all over the world—support a variety of insect and miscropic life. Here a young visitor to the Natural Science Center takes a close look.





Insects help break down animal and plant matter. They help to recycle nutrients by returning them to the soil.

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COVER . . . The poison-dart frogs of the family Dendrobatidae are among the most colorful animals in the tropical rain forest. They have evolved a variety of defensive skin secretions, including one deadly toxin that is used by Chocó Indians for poisoning blowgun darts. Variation within some species is extraordinary, as shown by this brilliant array of nine frogs that probably represent only four species; all were collected in western Colombia. Scientists from The American Museum of Natural History and the National Institutes of Health are investigating the biological and chemical diversity of poison-dart frogs. This research is providing new tools for biomedical research and new insight into the evolutionary ecology of a remarkable group of animals.