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ANNUAL REPORT OF THE
CHAIRMAN OF THE BOARD OF TRUSTEES
AND THE
PRESIDENT AND CHIEF EXECUTIVE OFFICER

Introduction  The period since our previous report has been one of progress.

- The complete modernization of the fourth floor dinosaur halls and the fossil mammal halls is well under way.  • The renovated Theodore Roosevelt Memorial Hall reopened in December 1991 with the great 50-foot-tall dinosaur, a Barosaurus, in place to welcome visitors.  • Construction of a new library building is ahead of schedule, and it should be in use early in 1993.  • The program of expanded and clarified directional signage will soon be inviting visitors to the numerous and diverse delights of the Museum.  • A strategic plan for the decade ahead, prepared by a joint subcommittee of Trustees and administration, has been approved and will guide us into the 21st century.  • The Museum's tradition of major expeditions has been re-energized, with study teams probing successfully in the Gobi Desert and in Cuba, jointly with Mongolian and Cuban scientists.  • Fund-raising has kept pace with the modernization program, with gratifying generosity being displayed by Trustees, members, friends, and corporate and foundation supporters. The following pages provide more detailed information.

PUBLIC PROGRAMS, SERVICES, AND PUBLICATIONS

The Museum continued to make strides in 1990-91 in interpreting to the public its scientific research and discoveries in order to make science appealing and comprehensible to visitors of all ages. One of the most important programs is a five-year initiative to recreate the Museum's permanent exhibition halls of dinosaurs and other fossil vertebrates. The design for the new halls incorporates an approach to organizing the displays based on current scientific concepts about evolution and the relationships among species. The renovated exhibition halls will not only provide a showcase for the Museum's world-famous collection of dinosaurs and other vertebrate fossils but will also enhance visitors' understanding of evolutionary and biological concepts. These halls will reopen to the public as they are completed, beginning with the Halls of Early and Late Mammals in 1993.

In the final stages of restoration in 1990-91, Theodore Roosevelt Memorial Hall reopened on December 4, 1991. The centerpiece of this dramatic public entrance to the Museum is the world's only mount of a Barosaurus, a giant, long-necked sauropod dinosaur, presented in a dynamic, upright posture—standing over five stories tall—protecting her young from an attacking meat-eating dinosaur, Allosaurus. This active scene recreated from a likely event some 150 million years ago reflects Museum scientists' current ideas on the biology of dinosaurs.

Work continued in 1990-91 on the new permanent exhibition, "Hall of Human Biology and Evolution," scheduled to open in 1993. This major exhibition will explore the structures and functions of the human body, the evolutionary history of human beings, and the beginnings of human culture and creativity. The displays are designed to excite and educate visitors of all ages and levels of scientific knowledge.

The Museum has also begun to take a more aggressive approach to interpreting and presenting the relationships between the study of the earth and its biological and cultural diversity and the crucial environmental issues of our day. Several such initiatives illustrate how and why basic research conducted by Museum scientists provides essential data needed to understand ecological and environmental problems with greater accuracy and clarity. A temporary exhibition mounted during the year, entitled "Tropical Rainforests: A Disappearing Treasure," explored the diversity of life within and the threats to the world's
diminishing rainforests. This exhibition was supplemented by a series of public programs that examined in greater depth the complex biological, geographical, political, social, and economic elements related to destruction of tropical ecosystems. The Museum entered into an agreement with the Environmental Defense Fund to mount a special joint exhibition, opening in May 1992, entitled “Global Warming: Understanding the Forecast”. This will be one of the first shows of national significance to address the somewhat controversial causes and implications of this threatening phenomenon. The exhibition will be on display at the Museum for eight months, after which it will travel to six cities around the country.

The American Museum of Natural History possesses one of the world’s largest collections of anthropological artifacts from cultures worldwide. The collection is so extensive that only a selection can be displayed in the permanent exhibitions of the Museum; temporary shows are organized to provide the public with glimpses of the many objects that usually remain out of view. Two special exhibitions that drew heavily on the Museum’s extensive collections of African and Native American artifacts were presented during the year: “The Way to Independence: Memories of a Hidatsa Indian Family” focused on the lives of three Native Americans from North Dakota to illustrate the variety of responses to social and cultural upheaval; “African Reflections: Art from Northeastern Zaire” was drawn primarily from artifacts collected by the Museum-sponsored Lang-Chapin Expedition of 1909-1915 to the Belgian Congo, artifacts that had not previously been displayed.

In an effort to make the Museum and both its permanent and temporary exhibits more accessible to visitors of all ages, planning began in 1990-91 for installation of a new and innovative signage system. Beginning in 1992, signage in various formats will be located at strategic points throughout the Museum to guide visitors around the halls, highlight temporary displays and invite attention to important exhibits that are relatively distant from the Museum entrances. The stations will also provide information about the current renovation projects.

Researchers and scholars from around the world rely on the Museum’s natural history library, which holds the largest collection of published and archival records on the natural sciences in the Western Hemisphere. Ground was broken in April 1991, for an eight-story addition. This will provide climate-controlled, accessible archival storage for the growing collection which now includes more than 420,000 volumes, 730,000 photographs, and 3,000 reels of film. Completion is expected early in 1993.

Complementing its exhibitions and educational activities are the many popular and scholarly publications of the American Museum of Natural History. Ten periodicals and numerous books are published by the Museum each year. One of the foremost publications devoted to the natural sciences in the country, Natural History magazine, has a paid circulation of more than 515,000. Each month, the magazine treats its readers to accounts of ongoing explorations in the worlds of biology, paleontology, astronomy, and human culture.

**Scientific Research and Expeditions**

The American Museum of Natural History continues to be one of the world’s most active centers of scientific field research and expeditions. Museum scientists conduct between 50 and 100 field expeditions each year. Among the many expeditions underway during 1990-91 were two truly outstanding projects that have received international attention. Museum scientists returned to the Gobi Desert of Outer Mongolia in 1991, following an invitation by the Mongolian Academy of Sciences to participate in a program of exploration and research aimed at understanding dinosaurs, other mammals, and other elements
of the ecosystem of Central Asia that existed from 100 to 40 million years ago. In conjunction with Cuban scientists from the Museo Nacional de Historia Natural, researchers from the Museum have undertaken a biological inventory of the island nation that has already uncovered dozens of previously unknown species of animals and plants.

As an international center for scientific inquiry, the Museum hosted the joint annual meeting of the American Society of Ichthyologists and Herpetologists and the American Elasmobranch Society (concerned with the study of sharks and rays), which drew some 700 biologists from 35 countries. Strengthening ties within the educational and research communities, the Museum signed a formal agreement with Columbia University, linking the research and teaching resources of the departments of anthropology at the two institutions. This newly formalized partnership reflects a history of scholarly interaction by the Museum, not only with Columbia but also with other centers of higher education in such fields as anthropology, geology, mineral sciences, invertebrate biology, and vertebrate paleontology. The Museum also initiated, jointly with Yale University, a rigorous program in which Ph.D. candidates train for work in molecular evolution and systematics. This program will draw on the Museum's new state-of-the-art molecular biology laboratory and its distinguished scientific staff.

**ADMINISTRATION AND PLANNING**

Fiscal 1991 saw the completion of an institutional strategic plan by a small committee of Trustees and senior administrative officers of the Museum, chaired by Trustee Helene L. Kaplan. For the decade ahead, the committee's report recommends an extensive program of research in natural and human history, a multifaceted approach for communicating the challenges of science to the public, a modernization and brightening of portions of our buildings, and an energetic schedule of financial renewal.

As part of a series of external reviews of all Museum divisions, a Visiting committee on Education and a Science Review Committee were appointed. The Visiting Committee on Education made recommendations concerning ways that the Museum can best carry out its mission of educating an increasingly diverse public and stressed the importance of striving to reach new audiences. The Science Review Committee was charged by the Dean
of Science to inquire into all aspects of science at the Museum, including quality of research, administrative structure, and relationships with other programs. The committee report, issued in June, made a number of useful recommendations. The committee concluded that the research enterprise at the Museum is strong, and expressed confidence that excellence in scholarship will continue to flourish as a central mission of the institution.

In the past year, the number of devoted individuals volunteering their time and energy to the Museum has risen by more than 100, bringing the total volunteer community to approximately 700. More than half of these volunteers work with the public; others work behind the scenes or at the Museum’s research stations. The volunteers support the efforts of the 737 loyal and dedicated staff members of the Museum.

**SUPPORT FOR THE MUSEUM**

A major reduction in New York City’s contribution to the Museum’s overall operating budget of $38.5 million (not including *Natural History* magazine) made it necessary to take some difficult steps: certain halls are now closed on an alternating schedule, the Museum is no longer open on Wednesday evenings, and it closes its doors slightly earlier on Fridays and Saturdays. In the face of these sharp cutbacks, insuring the economic vitality of the Museum now requires a greater emphasis on attracting increased support from other public and private sources.

Under the direction of newly appointed Senior Vice President for Development and Public Affairs Myra J. Biblowit (formerly Executive Vice President of the Central Park Conservancy) the Museum has developed a fund-raising plan to meet this challenge. The Museum completed the first full year of the *Campaign for the American Museum of Natural History*, by far the most ambitious fund-raising effort in its history, in June 1991, at which time more than $29 million in gifts and pledges had been received, including more than $15 million pledged thus far by the Trustees of the Museum. In addition to funds raised from private sources, New York City has allocated over $2.5 million in new capital funding for the fossil halls renovation and library construction projects.

To supplement the funding secured through the Campaign, in May 1991, the Museum entered into an agreement with the Trust for Cultural Resources for New York City. The Trust issued $50 million in tax-exempt debt instruments for the Museum. The proceeds will be used to help finance the cost of several current and planned construction and renovation projects throughout the Museum.

The Museum expresses its special gratitude to New York City Mayor David N. Dinkins, City Council Speaker Peter F. Vallone, and Manhattan Borough President Ruth W. Messinger for their continued and important support. The Museum also deeply appreciates the critical assistance provided by the Commissioners and staff of the New York City Department of Cultural Affairs, the Department of Parks and Recreation, the Department of General Services, the Landmarks Preservation Commission, and the Art Commission.

**TRUSTEES**

Further evidence of the public’s commitment to the Museum is its success in attracting to its Board of Trustees prominent individuals of vision and accomplishment. The Museum has welcomed seven new members to its Board since July, 1990: Lewis W. Bernard, a director of the Morgan Stanley Group; Melinda Blinksn, who was co-chair of the Women’s Committee of the Museum from 1970 to 1980; José A. Cabranes, United States District Judge for the District of Connecticut; Richard Gilder, partner in the brokerage firm of Gilder,
Gagnon, Howe & Co.; David A. Hamburg, M.D., president of the Carnegie Corporation of New York; Eugene R. McGrath, chairman of the board, president, and chief executive officer of Consolidated Edison of New York; and Frederick P. Rose, chairman of Rose Associates, the real estate development firm.

After the close of the fiscal year, the Museum continued to attract to the Board noteworthy new members. They are: Dr. Henry G. Jarecki, a diplomat of the American Board of Psychiatry and Neurology, and active in the commodities industry; Norman S. Matthews, retail consultant and former president of Federated Department Stores; and Dr. Charles A. Sanders, chief executive officer of the pharmaceutical company, Glaxo, Inc.

Three Board members will continue their association with the Museum as Honorary Trustees: Philip Anschutz, who joined the Board in 1982; Arthur Gray, Jr., who joined in 1961; and Oscar S. Straus II, who joined in 1953. The Museum expresses its sincere appreciation for the service of those who left the Board during the year: Ann Hutchinson, who joined the Board in 1984; Barnabas McHenry, who joined in 1981; and Lawrence G. Rawl, who joined in 1986. We also extend our thanks to former Trustee Charles Hedlund for his thirteen years of service to the Museum. The Museum lost a loyal supporter with the death of Donald C. Platten, a Museum Trustee since 1979 and national chairman of the Museum’s corporate campaign for almost a decade.

The Museum community was greatly saddened by the death of Albert E. Parr, director of the Museum from 1942-1959, and of Thomas D. Nicholson, director of the Museum for 20 years until his retirement in 1989. A memorial service was held at the Museum for Dr. Nicholson in recognition of his stewardship of the Museum, a stewardship which was marked by increased visitor attendance, expanded educational activities, and a restructuring and consolidation of scientific departments.

CONCLUSION

We live in a time when the demands placed on science and scientific institutions to seek solutions to the most intractable problems, and to educate a diverse citizenry about science-related issues have never been greater. To continue to be a world leader in meeting these expanding responsibilities, the American Museum of Natural History must rely increasingly on its friends and supporters for their commitment to the mission of this institution and for their expressions of confidence in its capability and potential. The approbation and active participation of Trustees, members, supporters, and volunteers that the Museum has enjoyed this year will become increasingly important in the coming years, as the American Museum of Natural History moves purposefully toward its vision for the 21st century.

William T. Golden  
Chairman of the Board of Trustees

George D. Langdon, Jr.  
President and Chief Executive Officer
The science and cultural communities, as well as the Museum itself, sustained a profound loss with the death at 68 of Director Emeritus Thomas D. Nicholson.

Dr. Nicholson, director of the Museum for 20 years until his retirement in 1989, had the drive and energy to author change, and the intellect, insight, and personal attributes to carry it out. Maintaining a close relationship with the American Museum of Natural History, he kept an office here, serving as an advisor and consultant.

Tom Nicholson joined the staff in 1954 as an associate astronomer at the American Museum-Hayden Planetarium. Successively, he became director of the Planetarium, and assistant director of the Museum. He was named director in 1969.


Dr. Nicholson’s tenure also saw the opening of new permanent exhibition halls: the Morgan Memorial Hall of Gems and the Frank Guggenheim Hall of Minerals (1976); the Hall of Reptiles and Amphibians (1977); the Gardner D. Stout Hall of Asian Peoples (1980); the Arthur Ross Hall of Meteorites (1981); the Margaret Mead Hall of Pacific Peoples (1984), and the Hall of South American Peoples (1989).

An accomplishment of which Dr. Nicholson was especially proud was expansion of the Museum by the imaginative use of existing space. Through internal renovation—the creation of mezzanines and compact storage facilities—some 300,000 square feet of usable space was added to the institution.

Dr. Nicholson recognized the need to reach out and meet the needs of the Museum’s diverse constituencies. He encouraged the Department of Education to institute innovative ethnic programming.

Although he was not himself a research scientist, Dr. Nicholson had a vast comprehension of the Museum’s scientific pursuits, and a broad vision of the roles a natural history museum can and should play in society. He worked closely with the curatorial staff to consolidate departments and to improve the planning, execution, and evaluation of scientific research.

His foresight in recognizing the importance of preserving and managing collections made the Museum a pioneer in that field.

Throughout his tenure, Dr. Nicholson pursued a broad policy of generating income by establishing a discretionary admission fee, creating a bigger cafeteria and a new restaurant, renovating the internal shops and the parking area, and allowing outside groups to use Museum spaces for events related to the interests of the Museum. Programs to increase Museum membership and broaden the scope of Natural History magazine also resulted in increases in the Museum’s income.

Always exploring new ways of attracting the public to the Museum, Dr. Nicholson brought to the institution the Naturemax Theater, featuring the IMAX film system.

Dr. Nicholson was also aggressive in expanding the Museum’s grant program. Under his stewardship, the Chapman Memorial Fund, the Theodore Roosevelt Fund, the Lerner-Gray Fund for Marine Research, and the Lincoln Ellsworth Fund were established to award grants every year to graduate and postdoctoral students to carry on their research. He also began a new program under which scientists are brought to the Museum to conduct research projects during five-year terms.

Dr. Nicholson focused attention on the preservation and restoration of books and the expansion of Library services. He centralized the Library’s administration, rare book room, photographic collection, archives, and art collection.

Truly a man for all seasons, Dr.

THOMAS D. NICHOLSON 1922-1991
Nicholson's many pursuits included an eight-year assignment, until 1972, as a weekend special events and weather broadcaster for WNBC radio and television. He also taught astronomy at the United States Military Academy and at Hunter College, and helped develop instruments for the Gemini space program. He was author and editor of numerous articles and books on astronomy, and wrote a regular astronomical column for Natural History.

Among the many museum and scientific organizations in which Dr. Nicholson was active were the Association of Systematics Collections, of which he was president from 1978 to 1980, The Association of Natural Science Institutions (TANSI), of which he was a co-founder, and the New York State Association of Museums, of which he was president from 1972 to 1976. He was council member and vice president of the American Association of Museums from 1974 to 1975, and chairman of the Cultural Institutions Group of New York from 1971 to 1972.

Dr. Nicholson took special pride and interest in personally motivating the Museum to become a pacesetting institution in behalf of the United Way. He received the New York United Way Campaign Award in 1985, and was chairman of the Cultural Institutions Group of United Way. Also in 1985, Dr. Nicholson received the Greater New York Blood Bank Award.

Dr. Nicholson, esteemed leader, colleague, and friend of the Museum community, will be sorely missed.

**Albert E. Parr 1900-1991**

A little more than a week after Dr. Nicholson's death, the Museum lost a figure from its past, Director Emeritus Albert Eide Parr, who died at the age of 90.

Dr. Parr was director of the Museum from 1942 to 1959. Stepping down as director in September, 1959, he became a senior scientist, enabling him to devote full time to research activities.

Dr. Parr was best known for his leadership in efforts to stress the interpretive function of museums. In 1980, he was the first recipient of the Distinguished Service Medal of the American Association of Museums.

During Dr. Parr's tenure as director, the Museum broadened its scope in ecological studies, exhibitions, and education programs. Research at the Museum's field stations emphasized understanding how humans interact with and affect the environment. The Warburg Memorial Hall of General Ecology, which opened in 1951, was devoted to addressing the interdependence of human beings and nature.

Other exhibition facilities that were opened under Dr. Parr's direction included the Sanford Memorial Hall of the Biology of Birds (1948), the Hall of North American Mammals (1954), the Hall of North American Forests (1958), and the special exhibition, "Men of the Montaña" (1951).

Dr. Parr, a marine biologist, was professor of oceanography at Yale and director of its Peabody Museum before he joined this Museum. He wrote numerous papers on oceanography and marine biology and founded and served as first managing editor of the *Sears Foundation Journal of Marine Research*. Dr. Parr was a past president of the American Association of Museums, and also served as a member of the United States National Commission for UNESCO.

Dr. Parr's many contributions left an indelible mark on the Museum.
**ANTHROPOLOGY**

**REMOTE SENSING**

David Hurst Thomas, curator, continued his archeological studies on the Mission Santa Catalina, St. Catherines Island, Georgia, in the context of a larger investigation of late prehistoric and protohistoric Creek Indian populations of Georgia. In collaboration with a team of geophysicists and geoarcheologists, Dr. Thomas designed a coordinated program of noninvasive archeology, relying on techniques such as proton magnetometry, gradiometry, resistivity, and conductivity testing.

A second major monograph on the archeology of the Mission is in preparation, and work was almost completed on describing his three-year archeological survey of St. Catherines Island, during which 140 new archeological sites were located.

Dr. Thomas also continued his investigations of high-altitude hunter-gatherers in the Monitor Valley of Nevada, spending two months of fieldwork in the region.

**SPIRIT POSSESSION**

Curator Laurel Kendall continued preparation of a monograph based on marriage practices in Korea as a lens through which to view contemporary Korean life. She also prepared a critique of sexual interpretations of spirit possession, and studied shamanic initiation in Korea. The latter project was carried out in conjunction with an ethnographic film project she undertook, in collaboration with filmmaker Diana Lee, to explore the contrasting possibilities of written and visual ethnographic forms.

Research Associate Soren Edgren completed a project, funded by the Luce Foundation, to catalog the Laufer Library of old and rare Chinese books. This contains an important and previously undocumented collection made during the Jacob H. Schiff Expedition to China from 1901 to 1904.

Curator Stanley A. Freed, in collaboration with Research Associate Ruth S. Freed, analyzed and published data collected in the North Indian village of Shanti Nagar from the 1950s through the 1980s. They completed a monograph dealing with ill-

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This carved wood and ivory container representing a Mangbetu queen was on view in the exhibition "African Reflections."

Department curators conducted research in both the Old and New Worlds, on subjects as various as the origin of modern humans, the role of museum collections in documenting vanishing cultures, the origin and evolution of chiefdoms, ancient Andean civilizations, and spirit possession. A continuing theme of the department's activities is the origination and execution of exhibitions about human cultural diversity and biological origins.

On behalf of the Society for American Archaeology, Dr. Thomas organized a three-year program to observe the upcoming Columbian Quincentenary. Nine seminars, involving more than 100 eminent specialists, were held to address the social, demographic, ecological, ideological, and human repercussions of Columbus's arrival in 1492. The seminars culminated in the publishing of three volumes by the Smithsonian Institution Press. Dr. Thomas plans to donate proceeds from the sale of these volumes, along with other publication series that he initiated, to a scholarship fund to provide assistance for qualified Native Americans to undertake graduate studies in anthropology.
ness, curing, death, and the supernatural world in that culture. Dr. Freed also continued to pursue his interests in the history, philosophy, and problems that face museum anthropology in the current social climate.

CERAMIC STUDIES AND CHIEFDOMS

Craig Morris, curator, taught at Cornell University while on leave part of the year. Working with Scientific Assistant John Hyslop, Dr. Morris encoded and entered into a computer database a large volume of the ceramics recovered during his major excavation of the Inka city site of Huanuco Pampa, Peru.

Robert Carneiro, curator, investigated the origin of chiefdoms, and lectured widely on this subject. He also conducted research on the related topic of the role of warfare in political evolution. He is working on a monograph which will integrate these research topics into a unified consideration of the evolution of societies from the autonomous village to the state.

SYMPOSIUM

Enid Schildkrout, curator, organized a symposium on "Tradition, Innovation, and Interpretation: Issues in the Collection and Display of the Arts of Zaire in Historical Perspective," in conjunction with the exhibition, "African Reflections: Art from Northeastern Zaire." Fifteen invited scholars discussed the history of collecting and exhibiting the cultures of Central Africa. The results of their deliberations will be published shortly. Dr. Schildkrout also continued research on several of the Museum's Central African collections.

HUMAN ORIGINS

Ian Tattersall, chairman, focused his research on the application of theoretical species concepts to the practical recognitions of species in the human fossil record. He broadened this application from fossil hominids to primates in general, drawing upon the results of a study of the Malagasy lemurine primates undertaken in collaboration with Research Associate Jeffrey Schwartz.

In response to a request to provide the biological background for a symposium on public monuments, Dr. Tattersall also launched an ongoing investigation into the origins of human creativity and its components.

Dr. Schwartz completed his year of research into the extinct Ipiutak population of northern Alaska with an analysis of the variation of cranial traits in a variety of modern human populations.
EXHIBITIONS

“African Reflections,” organized by the Museum, concluded in January and began its nationwide tour. The exhibition, “Arctic Art: The Harry Goldsmith Collection of Inuit Sculptures,” which opened in June, was prepared by Dr. Freed and Senior Scientific Assistant Laila Williamson. Ongoing exhibition projects included “The Way to Independence: Memories of a Hidatsa Indian Family,” also curated by Dr. Freed, which opened in July; and “Chiefly Feasts: The Enduring Kwakiutl Potlatch,” scheduled to open in October. Dr. Kendall served as in-house curator on two exhibitions on Tibet, “Tibet at the American Museum of Natural History,” which features photographs by Heinrich Harrer, and “To Preserve Tibetan Culture: Monks Demonstrate a Modern Craft.”

Work is proceeding on the new permanent Hall of Human Biology and Evolution, under the scientific supervision of Dr. Tattersall. During the year, plans were finalized, construction started, and several major exhibit elements were completed. The latter included a number of flesh reconstructions of extinct human ancestors, and a replica of part of the decorated Paleolithic cave site of Lascaux.

Tibetan monks from the Drepung Loseling monastery in Southern India demonstrate the craft of doll making in a month-long “living exhibit” at the Museum.
SKY SHOWS AND THE SKY THEATER

Chairman William A. Gutsch, Jr., and the Planetarium staff produced and presented a series of Sky Shows throughout the year. "Frontiers: New Discoveries in Space," narrated by Mark Lenard of "Star Trek," examined recent ground-based and space borne studies of the planets, stars, galaxies, and the cosmos.

During December, "The Star of Christmas" traced attempts by scientists and historians to fathom the nature of a light seen over Bethlehem 20 centuries ago.

In January, a Sky Show double feature was presented. "The Wind From the Sun," based on a short story by noted science fiction writer Arthur C. Clarke, examined the technology of solar sailing.

"City of Stars" explored the latest research on the wonders of the Milky Way Galaxy.

"City of Stars" was also the first public Sky Show to use fully the Sky Theater's new video projection capabilities to present some of the most sophisticated supercomputer simulations yet developed.

Preschoolers were introduced to the magic of the day and night sky in "Wonderful Sky," featuring the Sesame Street Muppets. R2-D2 and C-3PO of the "Star Wars" movie trilogy took older children on a tour of the universe in "Robots in Space."

Both shows, presented live by a teacher, have interactive elements and use state of the art computer-controlled projections. The programs are two of nine different shows presented during the year for school and preschool visitors.

In January, a new computer-controlled, 11,000 watt sound system was installed in the Sky Theater. The $100,000 system will allow for higher audio fidelity in all the Planetarium's school and public programs. The acquisition of the new equipment was made possible by a generous grant from the Hayden Foundation.

Planetarium attendance for the year was 464,805.

COURSES AND TEACHER/STUDENT WORKSHOPS

A wide variety of courses was offered throughout the fall, winter, and spring for adults and families. Topics ranged from astronomy to ground school for piloting. Classes were held in the Sky Theater and the Planetarium's classrooms, now equipped with the latest video laser disc equipment. A new course on cosmology, taught by faculty from Columbia University, was offered for the first time.

In conjunction with Columbia University astronomers, the Planetarium also offered teacher and teacher/student workshops. Lectures on the latest developments in astronomy and space science, activities for students, and teacher sessions were presented.

The solar eclipse as seen from the observatory at the summit of the Mauna Kea volcano in Hawaii. Astronomers and artists traveled there to observe the eclipse and gather information for American Museum-Hayden Planetarium programs.

Through Sky Shows, special lectures, workshops, school programs, and exhibitions, the American Museum-Hayden Planetarium helped nearly a half million visitors participate in the quest to explore the cosmos. A new Sky Show, "The Wind From the Sun" based on a science fiction story by Arthur C. Clarke, explored the technology of using the wind and light from the Sun to power a space vehicle. When the story was written three decades ago, this kind of solar sailing was just a dream. On this year's Astronomy Day, Planetarium visitors wrote personal messages to be sent on the first Solar Sail mission, set for 1992.
The Planetarium monitors NASA's space shuttle missions to gather current scientific information for incorporation into Sky Shows, courses, and exhibitions.

SPECIAL LECTURES AND ACTIVITIES

In the ongoing "Frontiers in Astronomy and Astrophysics" lecture series, leading research astronomers gave talks on topics ranging from astrophotography to large-scale galactic structure. Speakers included David Malin of the Anglo-Australian Observatory, Alan Dressler of the Observatories of the Carnegie Institution of Washington, and Michael Hauser of NASA's Goddard Space Flight Center.

In September, the Planetarium and the Smithsonian Institution cohosted the 10th International Planetarium Directors Conference. Directors from North and South America, Europe, and Asia attended. Paul Horowitz of Harvard University gave the banquet lecture on "The Search for Extraterrestrial Intelligence."

On April 20, National Astronomy Day was celebrated with "Solar Sailing" as the Planetarium's theme. Special events included lectures by World Space Foundation President Rob Staehle, solar sail model making workshops for children, and the collecting of personal messages to be sent into space on board the first experimental solar sail in 1992.

LIVE CONCERTS

In September, seven jazz artists presented "Jazz in Space," a live concert under the Sky Theater's starry dome. In December, "A Holiday Concert in Camelot" was performed by the Ensemble for Early Music. Visuals for the December concert were produced in cooperation with staff from the Metropolitan Museum of Art and the Musée Condé near Paris.

ART DISPLAYS AND SPECIAL CORPORATE EVENTS

First floor gallery space is reserved for the display of astronomical artwork by local, national, and international artists. An exhibition of works by leading astronomical artists and illustrators, including Kim Poor, David Hardy, B. E. Johnson, Michael Carroll, Jon Lomberg, and astronaut Alan Bean, was on display through the summer and fall. During winter and spring, an exhibit of works by California-based artist Dave Archer was shown.

The Planetarium helped host and create special corporate events for Black Enterprises, Burson Marsteller, The Discovery Channel, Goldman-Sachs, Oldsmobile Dealer TV Communications, Shiseido, Shimizu America, Inc., the Union Bank of Switzerland, and Ziff Davis Publishing Company.

RICHARD S. PERKIN LIBRARY

The Perkin Library is an invaluable resource for Planetarium staff and area scientists. Through a generous grant from The Perkin Fund, the Perkin Library purchased a laser disc player and color monitor which will allow the viewing of tens of thousands of images from NASA and observatories.
around the world.

The Perkin Library took part in an exhibition mounted at the Staten Island Museum entitled, “Showing Off: An Exhibition About Exhibitions,” and hosted a meeting of the New Jersey Chapter of the American Society of Information Science.

**STAFF ACTIVITIES**

Dr. Gutsch attended the 10th Biennial International Planetarium Society Conference in Sweden and Finland and the 10th International Planetarium Directors Conference in Washington and New York and gave papers at each. He also gave a series of keynote addresses on “The Planetarium in the 21st Century” at the Japanese Planetarium Conference in Tokyo and Osaka and completed work on a new book “The Search for Extraterrestrial Life.”

Dennis Davidson, astronomical artist, and Brian P. M. Sullivan, production designer, created works for “In the Stream of Stars: The Soviet/American Space Art Book.” Mr. Davidson was also represented in “Art of the Cosmic Age,” an exhibit of Soviet/Western space art at the Smithsonian Institution’s National Air and Space Museum. Mr. Sullivan created a series of spacecraft models for use in a new exhibit at the Boston Museum of Science.

Sandra Kitt, librarian, gave a paper at the Special Libraries Association meeting in San Antonio.
ENTOMOLOGY

SPIDERS

Chairman Norman I. Platnick studied the complex structures associated with silk-spinning behavior in spiders. Together with Research Associate Raymond R. Forster, and Jonathan Coddington and Charles Griswold of the Smithsonian Institution, he used the Museum's scanning electron microscope to survey the spinnerets of 47 genera of relatively primitive, "haplogyne" spiders (those which do not have separate copulatory and fertilization ducts). Most of these genera belong to families whose phylogenetic relationships have never been analyzed in detail.

The new information about spinneret morphology was added to data from more classical characters. A total of 67 features were scored for representatives of 36 families. The study included more than one third of the known families of araneomorph ("true") spiders. Computerized searches for the best explanations of the observed character distributions, and subsequent weighting of the characters based on their degree of agreement with those explanations, resulted in a detailed hypothesis of the relationships of the 36 families. Some classical groupings, such as the Haplogynae, were resolved in the analysis. Others, such as the superfamily Scytodoidea, appear not to be accurate.

As a result of the study, the genera Loxosceles, the notorious brown-recluse spiders, and Sicarius, a group found both in South America and southern Africa, were placed in a single family. This new grouping emphasizes the apparently close relationship between the only two genera included in the study that are known to have venom dangerous to humans.

Together with Weatherhead Fellow Vladimir Ovtsharenko from the Institute of Zoology in Leningrad, and former Weatherhead Fellow Song Daxiang of the Institute of Zoology in Beijing, Dr. Platnick worked on a review of the gnomphosine ground spiders of the USSR, Mongolia, and China. This work complements studies done some years ago on the American fauna of the group, and is the first instance of such international cooperation on Asian spider studies.

BEETLES

Curator Lee Herman worked on his revision of the generic, subtribal, and tribal classification of the Staphylinidae subfamily Paederinae. He completed a first draft description for 70 genera, with illustrations for 62 of them. Fifteen formerly valid genera are now regarded as synonyms, and more than 250 species have been transferred to other genera.

A checklist of the species for the genera in all but two of the 28 subfamilies of the Staphylinidae was completed. This checklist will form the basis of a catalog of taxonomic names and literature for the family. Previously published catalogs of the Staphylinidae list nearly 20,000 species. Since those catalogs were released, the number of species has nearly doubled. The catalog, which
will require several years to complete, will include verification of each original reference, the addition of the type locality and type species for each species and genus, and annotated subsequent references for each name.

**Moths**

James S. Miller, Kalbfleisch Curatorial Fellow, focused on two studies. The first is a revision of the Josini, a tribe of approximately 100 species belonging in the Neotropical moth subfamily Dioptinae (Lepidoptera: Notodontidae). Dr. Miller has found that generic concepts in the Josini are badly in need of revision. His research will ultimately produce a new generic classification based on cladistic relationships among the species. He also continued work on a monograph, co-authored with J. G. Franclemont of Cornell University, covering the 137 species of North American Notodontidae.

As part of his ongoing interest in the evolution of host plant associations in insects, Dr. Miller completed a manuscript discussing the host plants of notodontid caterpillars. It examines the importance of phylogenetic data in understanding host use patterns in Lepidoptera, using the Notodontidae as a model for discussion. The paper is an invited contribution that will appear as part of a special issue in the journal *BioScience*.

Frederick H. Rindge, curator emeritus and former George Willett Curator, completed a supplement to his 1987 revision of the geometrid moth genus *Eupithecia* in Chile. Dr. Rindge has been studying the American members of the tribe Boarmini for some years, and has now started working with Palearctic representatives. His aim is to ascertain the interrelationships within this group in the Northern Hemisphere.

**Bees**

Jerome G. Rozen, Jr., curator, studied the evolution of cleptoparasitism in anthophorid bees, as
revealed by their mode of parasitism and the anatomy of first instar larvae. Cleptoparasitic bees deposit their eggs in the nests of solitary bees, and food supplied for the young of the solitary bee is appropriated by the larval cleptoparasite. The first instars are equipped with elongated, sharp-pointed mandibles that permit them to kill the host egg or larva and thereby eliminate competition for the stored food. Dr. Rozen's research attempts to ascertain how many separate lineages of cleptoparasites occur in the family.

A revision of the cleptoparasitic bee genus Oreopasites was also completed. The species boundaries in this uncommon group of bees have been poorly understood because of the scarcity of specimens and because some of the anatomical variation seems correlated with, and influenced by, the host species. Focusing on samples of cleptoparasites associated with hosts, Dr. Rozen concluded that the genus contains one wide-ranging, relatively common species that is capable of parasitizing numerous host species. In addition, there are a number of other species with narrower host ranges. Six new species are now recognized, two of which form a new subgenus.

TRADITIONALLY, IN ENTOMOLOGY, COMPREHENSIVE SYSTEMATIC CATALOGS HAVE SERVED THAT FUNCTION. RANDALL T. SCHUH, CURATOR, WITH SUPPORT FROM THE NATIONAL SCIENCE FOUNDATION AND THE ASSISTANCE OF DATABASE PROGRAMMER GARY SHAPIRO, COMPLETED A COMPUTER CATALOGING SYSTEM THAT WILL ASSIST IN UPDATING A BADLY OUTDATED CATALOG OF MIRIDAE, A WORLDWIDE GROUP OF PLANT-FEEDING BUGS THAT INCLUDES SOME 10,000 SPECIES. THE CATALOG, IN THE FORM OF A RELATIONAL DATABASE, WILL ALLOW ENQUIRIES ABOUT GEOGRAPHICAL DISTRIBUTION AND HOST ASSOCIATIONS, AS WELL AS CONVENIENT UPDATING.

DR. SCHUH COMPLETED CHAPTERS DEALING WITH 29 FAMILIES OF TRUE BUGS FOR A VOLUME ON THE HETEROPTERA BEING PREPARED WITH RESEARCH ASSOCIATES JAMES A. Slater AND PAVEL STYS FOR CORNELL UNIVERSITY PRESS.

FLIES

David A. Grimaldi, assistant curator, received a three-year National Science Foundation grant to investigate the systematics and biogeography of certain living genera of Diptera that also have species fossilized in amber. The amber is from the Oligocene and Miocene of the Dominican Republic and Chiapas, Mexico. Relevant to this project was a study on the fossil mycetobiine woodgnats in Dominican amber, some of which have their closest living relatives in the Old World tropics. Present research is centering on the drosophilid genus Cladochaeta, distinctive in having larvae parasitic...
on the nymphs of spittle bugs (drosophilids normally breed instead in decaying fruits, flowers, and even wineries). There were 13 species in this genus; present work indicates that there are some 35 new species, all from North America and the Neotropics.

Work also began on the enigmatic genus Lygistorrhina, a frail-looking mycetophilid midge with reduced wing venation and a long thin proboscis. The smallest species known, found in Dominican amber, will be described, along with many living species from Central and North America.

Joining the department as a two-year Roosevelt Postdoctoral Fellow is Australian David Yeates. He works on the large, varied family of beeflies, the Bombyliidae. His research involves defining monophyletic portions of the beeflies, and determining to which families of other flies these groups are most closely related. Several small, enigmatic genera, such as Caenotus and Prorates, have been found not to belong in the Bombyliidae at all, but in other families.

CHANGES

The year brought important changes to the department's facilities and staff. The department completed the second year of a three-year facilities grant from the National Science Foundation. In connection with that award, existing structures within the department's main insect collection area were demolished, and new beams and flooring were installed to support two levels of compact storage. Almost one thousand cases of specimens will be housed in the renovated facility.

At the end of December, Dr. Rindge officially retired from the staff, after a 42-year career at the Museum. Dr. Rindge continues to work with the Lepidoptera collection he has nurtured so carefully throughout his years in the department.
GLOBAL TURTLE RECOVERY

The project, now in its second year, aims at protecting and restoring endangered and depleted freshwater turtles and tortoises. It is a cooperative initiative of the American Museum of Natural History; World Conservation Union, headquartered in Switzerland; the Durrell Institute of Conservation and Ecology and the Jersey Wildlife Preservation Trust, both in Great Britain; and Conservation International in Washington. The program is headed by Michael W. Klemens, program director for turtle conservation at the Museum. The program is currently comprised of 81 projects in 40 countries throughout the world. Typical projects include:

Madagascar—A team of scientists delineated a tropical dry forest sanctuary in northwestern Madagascar to serve as a refuge for the world’s rarest tortoise, Geochelone yniphora, locally known as the angonoka. Critically imperiled, Madagascan forest ecosystems, including lemurs, chameleons, and unique plants, will benefit from this new sanctuary as well. The Madagascar Department of Water and Forests, and the shuttle program of the National Aeronautics and Space Administration collaborated with the Museum on this project. NASA provided detailed photographs of the region taken from space by scientist and astronaut Jeffrey Hoffman.

Tanzania—Project scientists will work with students and faculty from the University of Dar es Salaam to monitor and attempt to recover the pancake tortoise, Malacochersus tornieri. This flexible species inhabits crevices, and is restricted in habitat to rock outcrops, locally known as kopjes, which dot the savannah of southern Kenya and northern Tanzania.

India—In collaboration with the Wildlife Institute of India and the U.S. Fish and Wildlife Service, surveys have begun to determine the distribution and conservation status of Indian turtles and tortoises.

LAKE BAIKAL

This frigid Siberian lake, the oldest and deepest in the world, has long been recognized for its fragile habitat. As an isolated environment, the lake has supported unique forms of aquatic life. In July, Research Associate Peter N. Reinthal made underwater observations and collected examples of the endemic sculpins living in the lake. Dr. Reinthal’s activities were supported by the National Geographic Society in conjunction with the Limnological Institute at Irkutsk.

MANGORO RIVER

During September and October, Dr. Reinthal, accompanied by Melanie Stiassny, assistant curator, and Gavin Naylor, Kalbfleisch Research Fellow in the Department of Vertebrate Paleontology, traveled to the Mangoro River in Eastern Madagascar to continue a survey of its fish fauna. The river is the last...
major waterway in the region with a near intact native fauna of the Malagasy rainforest. In some localities along the river, Dr. Reinthal found populations of exotic mosquito-fish (*Gambusia*) and potentially destructive tilapias (*Tilapia*). His activities were supported by the World Wide Fund for Nature and the National Geographic Society in conjunction with the Malagasy Departments of Fisheries and of Water and Forests at Antananarivo.

**SOUTH AMERICA**

Curator Charles J. Cole and his associates discovered the hybrid origin of the shiny lizard, *Gymnophthalmus underwoodi*, native to Trinidad, Guyana, and adjacent areas. The lizard is unisexual, consisting only of females, which reproduce by eggs without male influence. Unisexual species are thought to arise through natural disturbance of habitat, permitting hybridization between species previously isolated. In some cases of hybridization, an all female species is produced. Some one to three percent of reptiles are estimated to be unisexual (all female) species of hybrid origin. Genetic study of the shiny lizard revealed one of its two parental species, *Gymnophthalmus speciosus*, which is native to the same areas. The other parental species is as yet unknown.

**CUBA**

Michael Smith, Kalbleisch Assistant Curator (Fellow), completed two collecting trips to Cuba in a survey of its freshwater fishes. Dr. Smith's is the first comprehensive survey of freshwater habitats of that Caribbean island. It is now complete for the western two-thirds of the main island and the Isle of Pines. His activities were supported by the National Geographic Society in conjunction with Alejandro Dubouchet, researcher in ichthyology, Museo Nacional de Historia Natural, Havana.

**GLOBAL BIODIVERSITY CRISIS**

In June, Dr. Smith represented the Museum at the U.S. Government's workshop in San Francisco to develop a report for the United Nations Conference on Environment and Development. The conference is scheduled to take place in June, 1992, in Rio de Janeiro. Focusing on life in freshwater and oceans, the workshop amplified the view that the decline of aquatic life is a global crisis requiring international solutions.
Ichthyology Research Associate Carl J. Ferraris (top photo) studies the systematics of South American catfishes. Herpetology Assistant Curator Darrel R. Frost (center photo) examines a lizard from the Tropidurus group of South American Fence Lizards as part of his research on the evolutionary relationships among groups of Central and South American lizards. Ichthyology Scientific Assistant Radford A. Arrindell (bottom photo) inspects a Hemanthius specimen, one of thousands of specimens donated by the Fulton Fish Market Information Services.

**SOUTH AMERICAN LIZARDS**

Darrel Frost, who joined the department in July as assistant curator has completed a study of a group of South American lizards (*Tropidurini*), including some 45 species ranging to about nine inches in length. His studies were based on cleared and stained skeletal material prepared from specimens accumulated over many years at the Museum of Natural History of the University of Kansas, where he studied systematics of iguanian lizards (iguanas, horned toads, and allies).

**ASIH**

The American Society of Ichthyologists and Herpetologists has become the world’s most important society for the study of cold-blooded vertebrates. The Society publishes the journal *Copeia*, which has become the leading international journal in its field. During the first 10 years of the ASIH’s existence, its journal was published in the Museum by John Treadwell Nichols (1883-1958), then curator of fishes. Marking its 75th anniversary, ASIH returned to the Museum, where it was born in 1916, through the inspired effort of Nichols and two colleagues. Participating in this year’s meeting were 700 scientists from 35 countries.

**FACILITIES**

In October, the department received a two-year grant from the National Science Foundation for expansion of its storage facilities. This will affect the department’s collection of intact large fishes, which has grown dramatically in recent years and the dry skeleton collection, which now includes 9,880 cataloged specimens from the world over.

**CATALOGED COLLECTIONS**

During the year, 2,659 specimens were cataloged in herpetology; and 43,144 specimens (6,391 lots), including 2,684 skeletons, were cataloged in ichthyology.
**Biodiversity and Mass Extinction**

Niles Eldredge, chairman, completed a book-length study, “The Miner’s Canary,” on mass extinctions of the geological past and their implications for today’s biodiversity crisis. According to the study, there have been six major mass extinctions worldwide in scope, and many others of varying degrees of lesser magnitude. The many divisions of the geological time scale reflect these extinction events and subsequent evolutionary proliferations. Mass extinctions arise from the loss and drastic rearrangement of habitat area. The large-scale extinction at the end of the Mesozoic culminated in the extinction of many invertebrates, along with the better known dinosaurs and other terrestrial vertebrates. The extinction was caused, at least in part, by a collision between the Earth and an extraterrestrial object, such as a meteor or comet. However, all other mass extinctions reflect habitat loss occasioned by climatic change, most often a dramatic lowering of worldwide temperatures.

Past mass extinctions have much to tell us of present-day ecological problems—our modern-day “biodiversity crisis.” Agriculture, urbanization, and, most recently, chemical pollution of waters, soils, the atmosphere, and the oceans are typical examples of human habitat destruction. These actions mimic the effects of natural climate-induced habitat alteration that has underlain mass extinction episodes of the past. Understanding how our human behavior duplicates the natural workings of mass extinction underscores the urgency of curtailing human alteration of habitats in all major biomes, including the sea.

Dr. Eldredge also submitted an edited volume, “Systematics, Ecology and the Biodiversity Crisis,” for publication. An outgrowth of the symposium, “The Role of Museums in the Biodiversity Crisis,” held at the Museum in March, 1990, the volume includes seven contributions from the Museum’s curatorial staff.

**Mollusks**

William K. Emerson, curator, advanced his study of the distribution of marine snails in the tropical Pacific. Most marine invertebrate groups exhibit higher diversity (i.e., more species) in the tropics than in the higher latitudes, and the causes of this biogeographic pattern have long been debated. Dr. Emerson concluded that those groups that span nearly the entire world tropics are survivors of a widespread and rather ancient fauna. He also found that tropical eastern Pacific species related to species of the western (Indo-Pacific) regions, appear to have been relatively recent arrivals from western Pacific communities.

Associate Curator Neil H. Landman, in conjunction with colleagues in France, focused his studies of Mesozoic ammonite ontogeny, evolution, and systematics on the relationship between ecology and evolution in Jurassic and Cretaceous species. With support
from the National Science Foundation, he extended his monographic treatment of Upper Cretaceous ammonites of South Dakota into the realm of functional morphology. In keeping with the department's theme of integrating study of the past with knowledge of living species, Dr. Landman is documenting the embryology of the "living fossil" *Nautilus pompilius*, with Research Associate John Arnold.

**MOLECULAR SYSTEMATICS**

Assistant Curator Ward C. Wheeler, in conjunction with Laboratory Supervisor Paulyn Cartwright, investigated relationships among higher groups of arthropods. The two are focusing on the Onychophora, a phylum generally considered structurally intermediate between annelid worms and true arthropods. They have concluded that the Phylum Arthropoda is indeed a natural group, descended from a single common ancestor, and not derived from several different antecedent groups, as has been popularly supposed in recent years.

The laboratory in molecular systematics is an invaluable addition to the Museum's programs in systematics. Specific to the invertebrate program, Dr. Wheeler has been collaborating with graduate students Paul Vrana and Ranhy Bang on several projects on invertebrate systematics and developmental genetics.
BRYOZOA NS

Judith E. Winston, associate curator, has been preparing a book, "Describing Species." The shortage of trained systematists in invertebrate zoology is acute, and many species remain unstudied and unnamed. Dr. Winston's book will serve as a manual useful to both students and professional biologists who encounter taxonomic problems or undescribed species in the course of their marine biological studies. Dr. Winston also prepared a comprehensive overview of marine biodiversity, and the impending marine biodiversity crisis and conservation efforts.

In addition to her publications, Dr. Winston has devoted considerable effort to creating a modern reference and research collection of marine bryozoans. Her most recent work has focused on the northwestern and northeastern coasts of North America, the latter with support from the National Science Foundation.

BIVALVE SYSTEMATICS AND MASS EXTINCTION

Norman D. Newell, curator emeritus, has long been the world's leading authority on mass extinction. Together with Research Associate Donald W. Boyd, Dr. Newell completed a program of massive collecting of limestone blocks containing silicified fossils (removed by acid etching). The fossils were from either side of the Paleozoic-Mesozoic boundary, when the greatest mass extinction event so far to affect the Earth's biota took place. They are nearing completion of their work focusing on the systematics and evolution of scallops of the Permian and Triassic periods.

BRACHIOPODS, DIATOMS, CRUSTACEANS

Research Associate Howard R. Feldman pursued several projects on Middle Devonian brachiopods from New York State. Dr. Feldman also collaborated with Ellis F. Owen, of the British Museum of Natural History, and Francis Hirsch, of the Geological Survey of Israel, on brachiopods of the Ethiopian Faunal Province.

John J. Lee, research associate, concentrated this year's research efforts on the identification of many unusual species of diatoms (shelled algae) that live in the tissues of host species in the "living star sands" of the tropical and semitropical Pacific.

Linda H. Mantel, research associate, and her students continued their studies on hormonal regulation of salt balance, and regeneration and molting. They are measuring the binding of neurotransmitters to membranes isolated from gills of the blue crab, Callinectes sapidus, which affects the uptake of salt by these gills.

Niles Eldredge, curator in Invertebrates, two of whose books were recently published—one on the fossil record and one on mass extinctions. At his side, awaiting cataloging, is a box of 250-million-year-old invertebrate fossils collected on a Museum Discovery Tour to Alaska.
KOOPMAN HONORARY VOLUME

This year, a volume featuring 20 contributions authored by 30 specialists, among them many members of the department, was completed for publication as a Bulletin of the American Museum of Natural History. The collected papers honor the accomplishments and contributions of Curator Emeritus Karl F Koopman who studies the evolution and diversity of bats. Most of the papers in the honorary volume are about living and extinct species of this large group. Other titles reflect Dr. Koopman's interest in all aspects of mammalogy. Information on the findings in these papers will be presented in the next Annual Report after the Bulletin is published.

BOLIVIAN MAMMALS

Curator Sydney Anderson was awarded a three-year grant from the National Science Foundation to continue his survey of the mammals of Bolivia. The 1990 Bolivian Expedition was in the field from June through August, and obtained approximately 1,000 specimens which were divided among the participating institutions: the American Museum of Natural History, the Museum of Southwestern Biology at the University of New Mexico in Albuquerque, the Coleccion Boliviana de Fauna in La Paz, Bolivia, and the Museo de Historia Natural "Noel Kempff Mercado" in Santa Cruz.

CUBAN MAMMALS

Ross D.E. MacPhee, curator, together with Michael L. Smith, researcher scientist in the Department of Herpetology and Ichthyology, Mark A. Norell, assistant curator in Vertebrate Paleontology, and Columbia University graduate student in Vertebrate Paleontology Gina Gould, conducted the first expedition under a 1990 Museum-wide agreement with the Museo Nacional de Historia Natural in La Habana, Cuba. This agreement will allow Museum scientists from any scientific department to engage in research in Cuba under the auspices of the Museo Nacional and the Cuban Academy of Sciences.

The team prospected for Mesozoic and Cenozoic fossils in various parts of Cuba. The most important mammalogical discoveries were made at caves in Cueva del Mono Fosil and Cueva Alta in Pinar del Rio province of western Cuba. Here researchers found 80 fossils of a newly-discovered extinct monkey, Paralouatta varonai.

These new fossils will be invaluable guides to understanding the evolutionary relationships and adaptations of this primate. Currently, Paralouatta is regarded as a relative of Alouatta, the living howler monkeys of South and Central America. However, the new fossils indicate that the relationship is considerably more distant than previously thought. The precise age of the monkey fossils is not known, but it is probable that they are of late Quaternary age.
Dr. MacPhee, Dr. Smith and Ms. Gould returned to Cuba in June to continue their investigations. They were joined by Jennifer White, graduate student in evolutionary biology at SUNY, Stony Brook, who will study the extinct megalonychid sloths of the island. Funding for this work was provided by a grant from the National Science Foundation.

In addition to searching for more Quaternary monkey remains, the group will also examine Tertiary outcrops of Miocene and younger age in an effort to find the ancient ancestors of the Recent fauna.

PHILIPPINE MAMMALS

During June of 1991, the Philippine volcano Mount Pinatubo, quiescent for 600 years, erupted in a vast cloud of swirling ash and molten rock that transformed day into night over the island of Luzon. Modern volcanic cataclysm mirrors past geologic convulsions responsible for converting deep sea into vast archipelago.

From its origin in the early Tertiary, the Philippines have grown into an archipelago of more than 7,000 islands. Some are small, others are huge, some are oceanic, others are fragments of much larger islands from Pleistocene times, a few even had past connections to continental Asia.

The interplay of climatological, geological, and evolutionary processes within such an expansive archipelago has resulted in a mammalian fauna of more than 160 species. Among these are more than 40 species of rodents that occur on the Philippines and nowhere else.

Descriptions of species in this group, outlines of their distributions, and estimates of the evolutionary relationships among them and to rodent faunas in other parts of the Indo-Australian region are the subjects of a study completed by Chairman Guy G. Musser and Research Associate Larry R. Heaney for publication as a Bulletin in the Museum's publication series.

REVISION AND GENETIC STUDIES OF ZYGODONTOMYS

Two milestones were passed this year in the long-term research of Robert S. Voss, assistant curator, on the muroid rodent genus Zygodontomys. These savanna-dwelling mice are abundant in eastern Central America and northern South America where their evolutionary history seems to reflect prehistoric changes in the geographic distribution of tropical forests and grasslands.
Dr. Voss’s research on the evolutionary history of *Zygodontomys* began in 1986. His monographic revision and biogeographic analysis of the genus was submitted and accepted for publication in the Museum’s *Bulletin* series in March.

In conjunction with collections-based research on *Zygodontomys*, Dr. Voss is pursuing laboratory investigations with breeding colonies. The object of these studies is to determine the genetic basis of the differences in the physical characteristics used to determine evolutionary relationships. This year witnessed the publication, in the journal *Evolution*, of the first results from his laboratory research program, as well as the completion of a long hybridization experiment with rodents from Venezuela and Tobago.

By combining a revised understanding of rodent classification with data from genetic studies, Dr. Voss will be able to obtain a more detailed picture of the animals’ evolutionary history and their geographic variation. Tissue samples are being collected for biochemical analyses to help place the results of this research in a phylogenetic context.

**QUATERNARY EXTINCTIONS IN BRAZILIAN MAMMALS**

Dr. Voss also conducted revisionary studies of the mammals collected in caves near Lagoa Santa, Brazil, by the 19th-century Danish naturalist Peter Wilhem Lund.

Lund’s collections provide the most complete record yet available of late Pleistocene mammal diversity in tropical South America. The collection is of special interest since it is possible that late Pleistocene extinctions in South America, like those in North America, may have affected only large mammals. If true, this observation would support the hypothesis that human exploitation was predominantly responsible for the extinctions.

Working with Lund’s specimens at the Universitets Zoologisk Museum in Copenhagen, Dr. Voss discovered additional examples of muroid rodents that had been incorrectly listed as extinct. These species are actually still alive in Brazil or neighboring countries although little is known about these animals.

**RAINFOREST MAMMAL DIVERSITY IN FRENCH GUIANA**

Drs. Voss and Nancy B. Simmons, Kalbfleisch Research Fellow, visited the Museum National d’Histoire Naturelle in Paris to confer with G. Dubost and other museum scientists about an upcoming American Museum of Natural History research expedition to Guyana (French Guiana). Guyana’s undisturbed rainforest habitats provide a unique opportunity for establishing a several-year program to census rainforest mammals. A census is a critical conservation measure; there is no area in the South American tropics where an entire rainforest mammal
fauna has been effectively inventoried. In June, the first Museum expedition to French Guiana included Drs. Voss and Simmons, together with Darrin Lunde, a Cornell University undergraduate. The expedition was based at Paracou, a research field station maintained by the French forestry service near Sinnamary on the Caribbean coast.

**EVOLUTION AND DEVELOPMENT OF BEHAVIOR**

Dr. Ethel Tobach, curator emerita, conducted research on two problems in the study of the evolution and development of behavior: 1) the significance of the conceptualization of self and other in the development of social behavior and 2) the consequent effects of behavioral experience through different stages of development.

Understanding the behavior of captive animals may yield useful information on how to ensure reproductive success and so guarantee the animal's survival. To better understand orangutans concept of self, Dr. Tobach, together with her student, Alexander Skolnick, and her colleague, Gary Greenberg and his student, Jaime Haig, presented the orangutans at the Sedgwich County Zoo in Wichita with a mirror, still photographs and video images of themselves. The data indicate that an immature female and one adult female were most active in looking at the pictures and the mirror. The movements made by these two animals in front of the mirror indicated that they associated their movements with the reflected images. This information about their concept of themselves may help provide insights into how they will relate to other individuals.

The second problem is being studied in the larval *Tenebrio molitor*, the familiar mealworm. The worms are first observed in mazes. After metamorphosis, the effects of the earlier experience are assessed to probe the relationship between experience and developmental processes.

Different groups of larvae and adults were observed in a series of different mazes. Half of the larvae observed chose pathways that were previously used, whereas most of the beetles did this. The experimental assay of the effects of the early experience is yet to be done.

Crateromys schadenbergi is among the more than 40 species of rodents endemic to the Philippines. This fauna will be the subject of a future Bulletin of the American Museum of Natural History.
In the Guggenheim Hall of Minerals, visitors marvel at the world’s largest topaz crystal (596 lbs.) from Minas Gerais, Brazil.

**The Department of Mineral Sciences** manages extensive collections of minerals, gems, rocks, and meteorites. Samples are studied in order to provide insight into the history of Earth and planetary bodies and the processes that formed them. The collections are actively developed and used for departmental research.

**In the Field**

The year was very fertile for expeditions. Assistant Curator James D. Webster studied tin and fluorine deposits associated with volcanoes in northern and central Mexico and the Tanco pegmatite in Canada. Edmond A. Mathez, assistant curator, and Ph.D. candidate Robert Hutchinson, examined a platinum mine in the igneous Bushveld Complex of South Africa, making maps of the mine walls and detailing collections of the rocks. They also sampled a layer of similar platinum-rich rock from the Great Dyke of Zimbabwe.

Chairman George E. Harlow with T. W. Donnelly, State University of New York at Binghamton, examined geology and collected samples of jadeite rock and metabasaltic rocks along the Motagua Fault Zone, Guatemala. Dr. Harlow continued his research in Guatemala on a trip sponsored by the Geological Society of America.

With funding from the Black Rock Forest Consortium, Craig A. Johnson, curatorial fellow, and Dr. Webster advised Askold Chemych and Cheryl Eisenberg, undergraduates at Hunter College, in a field study of iron-rich rocks in the Forest. The goal was to improve understanding of these and similar deposits that were primary sources of iron in the 18th and 19th centuries. Many samples were collected, and a map of several magnetite bodies has been completed.

**The Collections**

The mineral and gem collections grew by 183 specimens: 100 by donation, 79 by purchase, and four by trade. Significant gifts include 18 pieces of jewelry from diverse cultures and eras from Helen Stillman; an extensive set of uranium and thorium minerals from Dr. Andreas H. Vassiliou; and eight cube-shaped canary-yellow synthetic diamonds from Aurora Gems. A total of 169 specimens were loaned to 15 institutions including Brown University, California Institute of Technology, Stanford University, and the Museum of Science in Boston.

The meteorite collections grew by 45 specimens as a result of exchanges, purchases, and donations. Some of the more important additions include Watson (Australia) and Maltahohe (Namibia), both irons with silicate inclusions; Esquel (Argentina), a pallasite; Palo Blanco Creek (New Mexico) and Ibitira (Brazil), both eucrites; El Djouf 89001 (Algeria), a new Renazzo-type chondrite, and Angra dos Reis (Brazil), an angrite. Eighty-four samples were loaned for research purposes to Rutgers University, University of Tennessee, University of California at Los Angeles, and the National Museum of Natural History in Paris.

In addition to the important rocks collected in the field (the Museum now has probably the most extensive collection of such material outside of southern Africa), a collection of mineral concentrates from North American kimberlites was acquired. Produced during com-
mercial diamond exploration about 10 years ago, these are important because they sample the subcontinental lithosphere, cover a wide geographic area, and include kimberlites that are now inaccessible.

**GRANITE-HOSTED MINERAL DEPOSITS**

Dr. Webster conducted research, supported by the National Science Foundation, on the formation of various magmatic ore deposits containing lithophile (rock-loving) elements such as tin, tungsten, and molybdenum. These ore deposits are typically enriched in fluorine and chlorine. An attempt was made to determine the role of these elements in water-rich fluids that generate the deposits. Chemical analyses of samples collected this year were used in combination with experimental melting studies and computations in order to understand how the deposits form. Further studies will be carried out in the department’s new experimental laboratory, planned for completion in late 1991.

**PLATINUM GROUP ELEMENTS AND GOLD**

With renewed support from the NSF, Dr. Mathez, along with Ph.D. candidate Cheryl Peach, continued their work on the platinum group elements (PGEs). Since PGEs are typically associated with sulfides in ore deposits, it is believed that sulfides act as “collectors” for them. Consequently, Peach and Mathez studied how the PGEs distribute themselves between sulfide and silicate melts. They and co-investigator Reid Keays, University of Melbourne, analyzed sulfides and glass (representing quenched melt) of submarine basalts by a technique known as radiochemical neutron activation analysis. They found that the iridium, palladium, and gold contents of sulfides are typically 10 to 20,000 times those of coexisting glass. Currently they are studying the analogous experimental system. The goals are to understand how chemical variations influence the PGE distributions and to determine whether phases, besides sulfides, affect the geochemistry of the PGEs.

**DIAMONDS**

With Jim Blacie and Carl Maggiore at Los Alamos National Laboratory, Dr. Mathez continued his NSF-funded research on diamonds. The general focus of their research was to deduce conditions of diamond formation in the mantle, and more particularly attempt to determine how much oxygen can exist in diamond.
VOLCANIC MELTS

The behavior of volatiles in volcanic melts is an important problem in igneous petrology. Robert A. Fogel, Boeschenstein Research Fellow, examined the solubility and speciation of carbon monoxide (CO) and carbon dioxide (CO₂) in these melts. A technique known as Fourier transform infrared spectroscopy aided in determining the gas concentration in the glasses. This was achieved by remelting them in the presence of the two aforementioned species at elevated temperature and pressure. Results show that basalt dissolves CO₂ totally in the carbonate form, whereas rhyolite dissolves CO₂ solely in the molecular form. Although the speciation is different, the total abundance of carbon is roughly equivalent. Dr. Fogel examined the controls on volatile carbon solubility with mathematical modeling. Results from simple models revealed the possible modes of carbon solubility. For example, a model based upon the possibility that carbon can dissolve in the C⁺⁺ ionic state reveals its inconsistency with the proper behavior of carbonate solubility; thus C⁺⁺ should not occur in silicate melts.

ARSENATES VERSUS ARSENIDES

Yongshan Dai, Kalbfleisch Research Fellow, joined the department in October to study the structural relationships and nature of atomic bonding in the calcium arsenates svabite, johnbaumite, and turneauireite, with respect to the intermetallic calcium arsenide, Ca₄As₂. Incorporating the Museum's X-ray facilities (newly improved with two new X-ray generators funded in part by NSF) in his studies, he has made significant progress on the structures of the arsenate minerals.

ANTARCTIC METEORITES

Once again, Antarctica has provided a treasure of new types of meteorites for study by Curator Martin Prinz and colleagues. His research, funded by the National Aeronautics and Space Administration, has shown that some of the new rare iron meteorites cannot be assigned to any of the established iron groupings. He further discovered that some even contain silicate inclusions that differ from any previously recorded.

The meteorite MAC88177 was determined to be a new, unique type. It may be chondritic (primitive) but has lost some of its constituents due to minor melting inside a planet. It is believed that its closest relative may be silicate inclusions, inside a group called IAB irons, but the connection is tenuous.

In collaboration with Robert N. Clayton, of the University of Chicago, the Belgica 7904 meteorite—another puzzling Antarctic find—was studied for oxygen isotopes. It was established that this meteorite belongs to a pre-existing group, but possesses the most water-rich alteration ever observed. Interaction with water is a very important part of early planetary history, and this finding offers new insights into how pervasive this process can be.

AQUEOUS ALTERATION IN METEORITES

The CM and CI carbonaceous chondrites closely resemble the Sun in chemical composition, and are the primary record of events which occurred early in the life of the solar system. Compared to other meteorites, they are rich in light elements, particularly hydrogen and carbon.

Drs. Johnson and Prinz measured the chemical compositions of carbonate minerals in these meteorites determining the physical conditions
under which the light-element-bearing minerals formed. The partitioning of elements between carbonates and other minerals was found to differ systematically between the two meteorite types. The light-element-bearing minerals were formed at varying temperatures by solutions which differed in chemical composition, reinforcing the idea that even the most “primordial” meteorites have been changed by processes operating on their parent bodies.

CR2 CHONDrites

Senior Scientific Assistant Michael K. Weisberg studied CR2 carbonaceous chondrites, which he recently defined as a new group. He has been examining their aqueous alteration history in an attempt to understand the evolutionary history of these primitive meteorites. Before the meteorites dislodged from their parent-body asteroid they experienced water-rock reactions that altered their mineralogy, producing serpentine, smectite, chlorite, and calcium-carbonate minerals. This is the first reported occurrence of chlorite in a carbonaceous chondrite group. The combination of mineral assemblages and compositions of the phyllosilicates and carbonates in the CR2 chondrites are unique and, thus, the history of aqueous alteration recorded differs from that of other carbonaceous chondrite groups.

HISTORY OF THE COLLECTIONS

Senior Scientific Assistant Joseph J. Peters and volunteers Charles Pearson and Bill Zeek continued documenting the history of the department’s collections. The documentation was recorded in journal articles, including one which looks at the history of the Columbia University Systematic Mineral Collection, acquired in 1980.
ORNITHOLOGY

20TH INTERNATIONAL CONGRESS

The International Congresses of Ornithology take place every four years. The 20th Congress was held on the campus of the University of Canterbury in Christchurch, New Zealand. The department took advantage of this important international gathering to discuss results of research and work in progress. Besides presenting papers, department members were involved in numerous other activities, including the organization of symposia and round table discussions. No other institution was as conspicuously represented.

SOUTHERN BEECH FOREST BIRDS

Ancient forests of southern beech trees (Nothofagus), found in widely separated south-temperate parts of Australia, New Zealand, South America and the tropical highlands of New Guinea, may harbor birds representing elements of what biogeographers call the Gondwanan biota. Gondwana is the name for the ancient southern supercontinent dating back more than 60 million years.

To complete his ongoing survey of the birds living in these forests, Chairman and Curator François Vuilleumier traveled to the remote island of New Britain in Papua New Guinea. Together with entomologist Dr. Hywel Roberts of the Papua New Guinea Forest Research Institute in Lae, he trekked through very rugged limestone country and camped in permanently drenched montane forest in order to study its avifauna. He also revisited southern beech forests in southern Australia and South Island, New Zealand. Some of this work was presented jointly with Jiro Kikkawa of the University of Queensland, Brisbane, Australia at the 20th International Congress.

Dr. Vuilleumier’s research also includes comparisons of south-temperate forest birds with those of north-temperate forests. He traveled to the northern beech (Fagus) forests of Japan in order to continue this study. The investigation focused on the foraging habits of phylogenetically unrelated birds in the two hemispheres to elucidate the phenomenon of avifaunal convergence.

ASIAN BARBETS AND AFRICAN HONEYGUIDES


Dr. Short and Ms. Horne continued their ongoing studies of honeyguides (Indicatoridae) at the Gallmann Memorial Foundation Ranch in central Kenya, where they now have color-banded over 900 individuals of four species. Regular trapping and visual observations,
added to radio-tagging and re-tagging of different key males and females, has provided knowledge of the detailed life history of individual birds over as many as eight years. The breeding strategies of younger and older males and females have thus become clear. Important insights into honey-guiding of humans to beehives were gained by following young Greater Honeyguides (Indicator indicator). For the first time, singing of female honeyguides was documented, thus affecting interpretation of the “song.”

SPOTTED OWLS

Associate Curator George F. Barrowclough initiated a major project to obtain DNA sequences in order to assay variability and geographic variation in Spotted Owls (Strix occidentalis). This research is being jointly undertaken with R. J. Gutiérrez of Humboldt State University, Arcata, California, and is being funded by a major grant from the U.S. Fish and Wildlife Service. This owl, an endangered species, has been the subject of considerable recent controversy between environmentalists and loggers over the significance of the old-growth forest that the bird inhabits in the Pacific Northwest.

JUNCO VARIATION

Dr. Barrowclough did fieldwork as part of his extensive and ongoing study of the genus Junco. The 1991 field season was spent collecting samples in British Columbia where “Slate-colored” and “Oregon” juncos intergrade and exchange genetic material. Skins, skeletons and tissues were collected during this expedition and will be analyzed as part of his research on geographic variation, species status, and phylogeny of this genus.

NEW SPECIES OF BIRDS

Senior Scientific Assistant Mary LeCroy and Dr. Vuilleumier are undertaking a critical analysis of new species of birds discovered during the ten-year period 1981 to 1990. Approximately 50 new species have been described during this interval, many of them from South America. Their work involves checking the validity of these taxa against the department’s incomparably rich collection. The impor-
C. Craig Farquhar, Chapman Fellow in the Department of Ornithology, takes body measurements of specimens from two populations of South American hawks— the Redbacked and the Puna—as one of the steps in determining whether they are members of the same species.

hemispheres, and some might be of sufficient antiquity to have been affected by continental drift. This research was presented at the 37th Annual Systematics Symposium of the Missouri Botanical Garden, St. Louis, Missouri.

ERNST MAYR HONORED

Called by Stephen Jay Gould the greatest living evolutionary biologist, Curator Emeritus Ernst Mayr was honored at a luncheon in the department. The luncheon marked the 60th anniversary of his association with the Museum and was attended by Museum administration, trustees, friends, and former colleagues from his years at the American Museum. Dr. Mayr started working at the Museum immediately after arriving in New York in 1931 from Berlin. He remained in New York until 1953 when he became Agassiz Professor at Harvard University, and later director of the Museum of Comparative Zoology. One of his major books, “Systematics and the Origin of Species,” was published while he was on the staff of the Department of Ornithology.

AFRICAN AND SOUTH AMERICAN AVIFAUNAS

Senior Scientific Assistant Allison V. Andors and Dr. Vuilleumier carried out comparisons of the fossil and recent avifaunas of Africa and South America. They found more taxa in common to the two areas than was previously suspected, and they speculated on the possible causes of this similarity. Among the birds shared by these two continents are flightless ratites (ostriches and rheas), cuckoos, and barbets. Of these groups, some have had a long history in the Northern and Southern
MONGOLIA AND CHINA

Michael J. Novacek, curator, Malcolm C. McKenna, Frick Curator, and Mark A. Norell, assistant curator, spent a month in the Mongolian People's Republic last summer making contacts with the Mongolian Academy of Sciences and local paleontologists. This resulted in a three-year agreement for collaborative field and museum research. Last year, the joint party surveyed late Mesozoic and early Cenozoic sites looking for dinosaurs and other fossils. Some of the locations they visited were discovered by the Museum's Central Asiatic Expeditions of the 1920s.

This summer, a two-month expedition was launched to implement the exploration and collecting planned in 1990.

Curator Richard Tedford, Research Associate Larry J. Flynn of Harvard University, and Zhanxiang Qiu of the Institute of Vertebrate Paleontology and Paleoanthropology, Beijing, won National Science Foundation support for two more years of collaborative research with Chinese and American colleagues in the Yushu Basin in the mountainous southeastern Shanxi Province of China. Final field work and systematic studies of all the mammals collected during the four-year project are being drawn together in monograph form.

SOUTH AMERICA

Dr. Norell and Research Associates Andre R. Wyss of the University of California, Santa Barbara, and John J. Flynn of the Field Museum in Chicago, obtained funds from the National Science Foundation to continue their work in the Andes of central Chile. They explored deposits around Termas del Flaco that produce the first early Cenozoic mammal remains found in Chile. The fossils seem to fill a prominent gap in the history of the South American fauna.

Curator John G. Maisey edited a large volume reviewing all the fossil vertebrates, insects and other invertebrates and plants from the Santana Formation of central Brazil which dates from the early Cretaceous. This volume included the work of many authors, as well as Dr. Maisey's extensive contributions on the famous fish remains of this formation. Collaborative work with Brazilian colleagues on this fauna is planned.

AUSTRALIA

Curator Eugene S. Gaffney and Dr. Tedford worked with colleagues in Australia. Both attended and presented papers on their Australian research at the biennial meeting of vertebrate paleontologists of that country. Dr. Gaffney spent time on Lord Howe Island investigating the geological occurrence of the horned turtle *Meiolania*. New Tertiary meiolaniid turtles have also been discovered in Australia and these are the subject of his research. Dr.
Recent finds of Cretaceous vertebrates from the Museum's expedition to Outer Mongolia (top photo) were presented at a conference. From left to right are Exhibition Assistant Marilyn Fox, Frick Curator Malcolm C. McKenna, Exhibition Assistant Jane Mason, D. Dashzeveg from the Mongolian Academy of Sciences, and Senior Scientific Assistant John P. Alexander. Ms. Fox (photo left) prepares the skull of the Mongolian mastodont Platybelodon, a distant relative of the modern elephant, which will go on view in the renovated fossil halls.

Tedford began to draw data from collections and documentation in Australian museums in preparation for a forthcoming summary of the Pleistocene mammals of that continent with collaborator Ernest Lundelius, Jr., of the University of Texas.

**OTHER ACTIVITIES**

In addition to these international projects, the staff undertook field projects in the United States and initiated projects using the Museum's collections.

Dr. Tedford spent a field season in the northern Albuquerque Basin, New Mexico. This year's work emphasized comprehensive fossil collecting now that geological studies of the Miocene rocks are completed.

Dr. McKenna returned to the Lion Mountain-Black Butte area of southwestern Montana to further elucidate its sequence of fossil faunas that cross the Eocene-Oligocene boundary. In addition to continuing work on the classification of mammals, he is involved in diverse projects that range from studies of marsupials to desmostylians (an extinct group related to elephants), and sloths.

Dr. Novacek studied the evolutionary history of bats, working on some of his research with Kalbfleisch Research Fellow in Mammalogy, Nancy B. Simmons. He also completed a major review of the evolution of the mammalian skull. With Dr. McKenna and Fred Szalay of CUNY, he edited the proceedings of the successful symposium on the evolutionary relationships of mammals held at the Museum last year.

Dr. Norell worked on various studies of crocodilians. He also began working on Jurassic plesiosaurs, extinct aquatic reptiles, with Cuban colleagues and even tried his hand on South American mammals with Dr. Wyss.

The presence of Frick Research Fellow Xiaoming Wang, Columbia and City College graduate students, and other teaching responsibilities also kept the staff very busy.
RESEARCH STATIONS

SOUTHWESTERN RESEARCH STATION

Founded in 1955 with financial assistance from David Rockefeller, the Southwestern Research Station has established itself as one of the foremost field stations in North America. Each year SWRS supports the field research activities of scientists from North America and overseas, providing laboratories and accommodations in Cave Creek Canyon of the Chiricahua Mountains in Portal, Arizona.

This locality is well known to birders across the nation as an outstanding location to see unusual species, such as the elegant trogon, Mexican chickadee, magnificent hummingbird, flammulated owl, and buff-collared nightjar. The unusually species-rich biota is not restricted to one taxonomic group. Scientists of diverse disciplines—ecologists, animal behaviorists, entomologists, herpetologists, mammalogists, and others—find the setting ideal for pursuing their studies.

The great diversity of species found in the area is due to the station's location at a 5,400-foot elevation in a mountain range that extends upward from the surrounding valleys through five of the life-zones of western North America. The Chiricahua Mountains are a mixing area for species of a more northerly biota, the Rocky Mountains, and a southerly biota, the Sierra Madre Occidental of Mexico. The surrounding valleys are in a biogeographic corridor between the Sonoran and Chihuahuan deserts, again adding to the species richness of the region and providing an exciting biota for scientific investigation.

Wade C. Sherbrooke, director, researched the antipredator defenses of horned lizards, the cellular basis of color in lizards, and the physiology of color change mechanism in lizards. Dr. Sherbrooke, in collaboration with George A. Middendorf of Howard University, discovered that domestic dogs can elicit from horned lizards the bizarre "blood squirting" behavior. When provoked by dogs, the lizards shoot a stream of blood from a sinus surrounding their eye. Presumably, the blood provides some form of defense for the lizards. This will be the subject of further study now that the behavior can be elicited in a systematic fashion.

Nearly 1,300 people stayed at the station during the year. Among those that spent one or more nights were 141 researchers, 10 classes totaling 152 students, 16 tours totaling 353 participants, and 514 other naturalists. Scientists visiting the station presented 43 seminars for the community.

The Museum's grant and fellowship program continued supporting the activities of young scientists working on degree programs carried out at the station. Two students received grants from the Theodore Roosevelt Memorial Fund, and four students were recipients of Southwestern Research Station Student Support Grants. This support continues to foster the development of students dedicated to scientific field research and the expansion of knowledge about the natural environment.

The museum's four research stations attract scientists and students from the world over. Resident and visiting scientists study a wide range of animal and plant life in diverse ecological habitats. Graduate and undergraduate students may take advantage of these research sites for long-term investigations in geological, archaeological, zoological, and biological sciences.
A bluff on the North Beach of St. Catherines Island (photo right), and a historic ruin among the lush palmettos on the southeastern side (photo left) show some of the diversity that makes the island such a valuable research site.

Construction of a new core equipment laboratory is nearing completion. Funded in part by the National Science Foundation, the facility is the first expansion of the laboratory buildings in more than three decades. The laboratory will feature constant temperature chambers, a chemical venting hood, dissecting and compound research microscopes, balances, and other equipment applicable to the diverse needs of a large number of visiting scientists.

The strong volunteer program continued to attract many students from as far away as Brazil, Canada, England, and Italy. Mostly undergraduates, volunteers assist with station maintenance in exchange for room and board, then spend their remaining time assisting researchers.

Thus, the volunteers become integrated into research projects and gain real-world experiences in field biological research.

**GREAT GULL ISLAND**

Situated 17 miles northwest of Montauk Point in Long Island Sound, Great Gull Island contains the largest concentration of individually marked Common Terns in the world. Helen Hays, chairwoman of the Great Gull Island Committee and director of the Great Gull Island Project, oversees the research station's long-term study of the reproduction and population dynamics of this Common Tern breeding colony.
In 1990, more terns nested on Great Gull Island than ever before. Teams of volunteers and student interns marked more than 8,000 Common Tern nests. Some 10,000 chicks were banded, and 5,835 adult pairs were measured and studied.

More than 90 percent of all Common Terns collected for study on the island had been banded previously, some with established histories going back many years. The majority are of known ages ranging from two years to 24 years old. More than 1,000 Roseate Tern nests on the island were marked, and almost 200 pairs of this endangered species were collected for study and released.

Though the terns leave the island in August, field work continues well into the fall. Central portions of the island, as well as areas at the eastern and western ends, were extensively cleared of brush to provide more nesting space for the terns in 1991.

A major grant from the Norcross Foundation enabled the project to accomplish necessary repairs and maintenance of the observation towers and other facilities. The project also received funding for another year to complete the computerization of 25 years of data collected on Great Gull Island. Ongoing data entry includes information on adult terns from colonies near Great Gull Island, behavioral observations collected on Great Gull, and records on all non-tern species on the island.

In the 1990 "Birdathon" fundraiser, 40 dedicated birders, backed by 421 sponsors, raised a total of $19,175.

**St. Catherines Island**

Research conducted on St. Catherines Island, a barrier island off the Georgia coast, includes archeology, ecology, geology, and evolutionary biology. David Hurst Thomas, curator in the Department of Anthropology, is the Museum’s principal investigator in the archeology program on St. Catherines. The program is administered by the Office of Grants and Fellowships.

Dr. Thomas and his colleagues have just begun a three-year program to study the adaptations of coastal Creek Indians of Georgia from A.D. 1450 through A.D. 1700. This research examines what life was like during precontact times, and how the social environment changed with the arrival of Spanish settlers. In 1990-1991, this investigation employed a broad range of

*Diane Wagner, a research scientist and doctoral candidate from Princeton University who is working at the Museum’s Southwestern Research Station, studies a lycaenid butterfly feeding on white-thorn acacia flowers.*
geophysical prospecting techniques to explore key Creek Indian sites. By employing nondestructive, noninvasive technology—such as magnetometry, resistivity, conductivity, and gradiometry—the investigators were able to learn from archeological sites while conserving these nonrenewable resources for future generations.

Placing the contact-period excavations on St. Catherines into the context of the upcoming Columbian Quincentenary observance, Dr. Thomas has just completed nine interdisciplinary “Columbian Consequences” seminars, culminating in three books published by the Smithsonian Institution Press.

**ARCHBOLD BIOLOGICAL STATION**

Scientists at the 5,000-acre station, located in south central Florida, conduct research in the areas of ecology, evolutionary biology, biogeography, and animal behavior.

The station provides an important refuge for threatened and endangered species. Except for a few small protected areas, the unique scrub community characterizing the southern Lake Wales Ridge, where the station is located, has virtually disappeared. Growth of human population and the rapid spread of citrus agriculture threaten the existence of large numbers of distinctive, locally endemic plants.

Recent discoveries of rare plants, such as *Dicerandra*, scrub mint, as well as federal efforts to create a national wildlife refuge on the Lake Wales Ridge for 13 endangered plant species, focused national attention on the rapidly disappearing scrub surrounding the station.

Efforts of the Archbold Biological Station are directed toward studying the scrub problem, educating the public, and preserving the existing scrub. With The Nature Conservancy, the station developed a new proposal for public purchase of 20 important remaining scrub tracts on the Lake Wales Ridge by Florida’s Conservation and Recreation Lands (CARL) program.

Steve K. Friedman is a new Geographic Information System (GIS) specialist developing a GIS computer facility under a National Science Foundation pilot grant. GIS projects already underway include: regional land use on the Lake Wales Ridge, scrub jay habitat and territory analysis, and vegetation maps for Archbold Biological Station main property and Buck Island Ranch.

More than 50 visiting scientists and resident staff investigated plant and animal ecology at the station. Among the projects conducted by the station’s Executive Director John W. Fitzpatrick and staff were life-history research on Florida’s rare and endangered arthropods, and pollination biology of rare endemic scrub plants. Research was also conducted on interactions between fire, trees, insects, and woodpeckers, as well as conservation biology and habitat guidelines for the Florida scrub jay, and patterns of daytime refuge use by opossums. Under the leadership of Eric S. Menges, research biologist, the station carried out nine prescribed burns (totaling 320 acres), satisfying several research and land-management goals.

In its second year, the environmental education program for elementary school students, “Florida Ecology—Getting to Know the Real Florida,” reached more than 1,000 children in central Florida. This comprehensive program emphasizes local habitats and includes a day-long visit to the station by each participating class.

The station purchased two tracts adjacent to its main property. The 464-acre MacArthur Tract, long a priority for acquisition, includes a mix of oak scrub, flatwoods, and temporary ponds, and contains populations of at least 10 plant species listed as “endangered” or “threatened” by government agencies. The 10-acre Lambert Tract includes a much-needed, four-bedroom house.

In February, the station hosted a U.S. Geological Survey interagency meeting on “Geology and Hydrology of South-Central Florida.” In the spring, The Nature Conservancy conducted an “Advanced Fire Management Workshop” at the station, attracting 25 land managers from preserves throughout the country.
ADULT EDUCATION

Approximately 7,000 adults participated in the department’s workshops, local field trips, summer cruises, and 32 lecture series. The lecture series attracted more than 5,300 persons and covered topics from “Human Origins,” given by members of the scientific staff, to “Myths out of Africa,” in connection with the “African Reflections” exhibition. Morning bird walks in Central Park, summer geology cruises in New York Harbor, and local weekend field trips (one for birding enthusiasts, another for whale watchers) provided 1,700 participants with spectacular nature experiences.

The department continued its program of semester-long college accredited courses for New York City school teachers in cooperation with the City University of New York; 203 teachers enrolled.

The 14th annual Margaret Mead Film Festival was the largest single adult event. Over the course of four evenings, more than 6,000 people viewed documentary films and heard an international group of filmmakers and anthropologists discuss their work.

Several other very successful film programs were presented, attracting an additional 6,500 people. Highlights of the department’s film series included “Favorite Short Films,” a joint program presented with the New York Film and Video Council. Works selected by film programming professionals, ranging from animation to serious documentaries, were presented. “Cinema and Society” featured six films from Korea, Japan, and Taiwan. In association with the World Wildlife Fund, some of the newest works of the world’s best wildlife filmmakers were shown in “Wildscreen 1991.”

In a joint program with The Academy of the American Poets and the Natural Resources Defense Council, the department presented two lectures in the “Writers on the Environment” series. In January, authors discussed the Native American perspective on the environment. In April, authors focused on their work as it related to the rainforest. The programs attracted a total of 1,600 people.

Four slide-illustrated presentations of field research expeditions were presented during the evening program, “Earthwatch—Research in the Field.” James Van Tassell, field associate in the Department of Ichthyology and Ichthyology, presented his studies on the sea life of the Canary Islands. Noted authority on primate behavior Clifford Jolly, professor of anthropology at New York University, discussed his research on baboons. The Earthwatch volunteers discussed their experiences in the field through their slide presentations.

The extremely popular annual “Identification Day” brought hundreds of the public’s favorite curios, souvenirs, and flea-market acquisitions of natural objects and artifacts to the Museum for identification. Also during ID Day, New York City’s Department of Environmental Protection tested water samples free of charge and answered questions about water quality.

Members of the Asmat tribe from Irian Jaya on the island of New Guinea carve an elaborate, 25-foot ancestral pole during the Museum’s “Festival of Indonesia” program.

The department’s aims are to enhance learning opportunities for people of all ages, and to focus on adding to public understanding of the Museum’s exhibited collections, research, and conservation activities. In its public programming, the department also addresses important contemporary issues, ranging from ecology to intercultural understanding.
Youngsters from the New York City public school system (top photo) participate in a discussion in the Hall of African Peoples led by Lisa M. Sita, an instructor in the Department of Education. Mineral Sciences Research Fellow Michael R. Weisberg (bottom photo) helps identify rocks and minerals during the Museum's annual L.D. Day, during which scientists examined unknown natural science specimens that were brought in by the public, and tested water samples from communities throughout New York State.

In conjunction with the special exhibition, “Tropical Rainforests: A Disappearing Treasure,” a number of interpretive programs were held. A symposium brought more than 260 people to a day of presentations by scientists on tropical rainforest conservation and species preservation. A two-day workshop further explored the issue. A lecture series and bus tour around the Museum, New York Botanical Garden, and the Bronx Zoo completed the activities.

SERVICES TO SCHOOLS

Telephone reservations were taken for some 6,200 school classes (representing nearly 165,000 children) to visit the museum independently with their teachers. In addition, more than 30,000 New York City children participated in programs taught by museum instructors. The most popular areas among classes were the Halls of Dinosaurs, Ocean Life, Eastern Woodlands, Plains Indians, and African Peoples.

A unique program was offered in conjunction with the “African Reflections” exhibition. Thirteen hundred school children experienced a participatory theater program “Azapane and the Peanuts,” written and performed especially for this exhibition. It drew family audiences of 5,000 people on weekends as well.

Special education activities were supported by a gift from the Vidda Foundation. Programs for visually and hearing impaired and learning disabled youngsters were available, as were regular school programs. More than 85 special education classes took part, serving nearly 820 people.

The Museum also works with junior high school pupils at their schools. This year, ecology talks were given to more than 1,300 students by a senior instructor from the department.

Teaching volunteers were stationed in several exhibition halls, providing short, informal learning experiences for school groups visiting the museum independently. Fifty volunteers served some 21,000 youngsters and their teachers.

The department continues to offer the most extensive Black History Month program of any cultural institution in New York State. During that one month (February) 11,000 school children attended participatory craft workshops, folk-tale programs, music, dance, and film programs. Nearly 14,500 more attended evening and weekend programs with adults and families.
CHILDREN'S PROGRAMMING

More than 300 children, from pre-kindergarten to seventh grade, participated in weekend workshops such as, “Inside Your Body,” and “Chinese Brush Painting.”

Two hundred and fifty Girl Scouts, 60 chaperones, and numerous volunteers camped out under the blue whale in the Museum’s Hall of Ocean Life for a night of science study, movies, origami, and general fun in the fourth annual overnight Camp-In program.

Now in its second year, an innovative and collaborative project with the City of New York Department of Cultural Affairs offered two programs for children living in temporary shelters. In a week-long series of art and anthropology workshops, one group of youngsters focused on African cultures. Another group explored the subject of light and optics in a 10-week hands-on science program.

COMMUNITY PROGRAMMING

Each month from October through June, the Frederick Leonhardt People Center of the Charles A. Dana Education Wing focused on a different region or cultural tradition. Indian, Korean, African, Caribbean, Latin-American, Asian-American, and Pacific themes were highlighted with live performances of music and dance, slide talks, and craft demonstrations. Highlights included Africa Month programs in conjunction with the exhibition, “African Reflections: Art from Northeastern Zaire;” the annual Kwanzaa celebration; and “The Asmat: Spirits of the Ancestors” program. More than 60,000 people participated in the weekend programs.

Community programs were supported by gifts from the Asmat Progress and Development Foundation, Citibank, the Chase Manhattan Bank, the Christodora Foundation, the William R. Hearst Foundation, the Henry Nias Foundation, the National Endowment for the Humanities, the New York Urban Coalition, the New York State Council on the Arts, the Rockefeller Foundation, the Samuel and May Rudin Foundation, and the Sidney, Milton and Leoma Simon Foundation.

Some 700 people attended a live performance of traditional dance and music from Shimane Prefecture in Japan. “People of Shimane, Japan: The Land of Myth and Legend” showcased nearly 60 of the top performers from one of the most artistically unique areas of Japan.

Fifty elementary school teachers participated in the third year of a program for teacher training under a grant from the National Science Foundation received by Community School District 4. The 15-week course was designed by Museum staff to help teachers better use the Museum as a science teaching resource.

Twenty-three students from Harlem and the Bronx participated in the Junior High School Natural Science Program, a year-long course combining museum study, laboratory investigation, and outdoor exploration. Laboratory activities and science workshops for teachers developed for this program were also offered.
A new science project for junior high school students began this year for those interested in effecting change in the environment. Eighteen students met weekly in the “Environmental Investigators’ Club” to review local, national, and international environmental issues.

As part of increased outreach to metropolitan communities, programs directed toward Asian-American populations were expanded. A two-month Asian/Pacific-American celebration actively engaged Asian specialists in the arts, media, anthropology, and sociology. Several special events by visiting artists from Hawaii, India, and Indonesia were included.

Now in its second year, the Arts-in-Education Program focusing on Asia for New York City ninth graders included Chinese, Korean, and Indian cultural components, and a teacher-training workshop series.

In conjunction with the national Festival of Indonesia in April, Clifford Geertz, an Indonesian expert from Princeton University’s Institute for Advanced Studies, spoke on “Art Across Cultures,” gamelan concerts were presented by the New York Indonesian Consulate Gamelan, and the Dharma Swara Balinese Gamelan were presented.

The programming year ended with a special event—Asmat people from Irian Jaya, Indonesia, on their first United States visit, spent 10 days at the Museum in public programs that demonstrated the carving of an ancestral pole, ceremonial drumming, dancing, and ritual life and recounted myths and legends.

INTERPRETIVE ACTIVITIES

The Alexander M. White Natural Science Center in the Charles A. Dana Education Wing and The Discovery Room are designed for youngsters between 5 and 10. Both facilities, providing special learning opportunities, are open weekends from October through July on a first-come-first-served basis. The Natural Science Center focuses on urban ecology and includes many interactive elements. Most of its 27,271 visitors this year came on weekends and in family groups, and school classes also received daily instruction in this facility during the week.

More than 5,490 people—parents and children—investigated artifacts and specimens in the Discovery Room on weekends. During the week, it was also the setting for teaching programs for visually impaired and learning disabled youngsters.

A total of nearly 200,000 visitors, young and old, had direct contact with lecturers, workshop leaders, demonstrators, explainers, or others presenting programs for the public.
EXHIBITION AND GRAPHICS

RENOVATIONS

In September, the new Arthur Ross Meteorite Theater was opened in the Hall of Meteorites. The theater features a split-screen video presentation on current theories about the effects of meteoritic impacts on the biology of the planet. Fiber-optic lights in the theater ceiling give an illusion of night sky, while a new 13-foot-square copy of an Apollo 13 photograph of the "dark" side of the Moon graces the outside. A new interactive video program challenges visitors with questions and answers about meteorites and comets in the renovated hall.

EXHIBITS-OF-THE-MONTH

The Arthur Ross Foundation sponsored several "Exhibits-of-the-Month," including: "Back to the Gobi," on display in the Hall of Late Dinosaurs, featuring documentary photos, film and fossil specimens illustrating ongoing Museum expeditions to Mongolia; "Arctic Art," an exhibit of contemporary and ancient Inuit sculpture; and "Horseshoe Crabs: Bluebloods of the Sea," on exhibit in the Hall of Invertebrates.

The Arthur Ross Foundation also provides generous support each year for the Origami Holiday Tree.

In September, the Akeley Gallery was the site of an exhibit of winning entries in a photography competition celebrating the 90th anniversary of Natural History magazine. Another photography exhibit, "Pre-Hispanic Foods of Mexico," jointly sponsored with the Mexican government, was displayed in January.

TEMPORARY EXHIBITIONS

"Tropical Rainforests: A Disappearing Treasure," in Gallery 3, featured a life-sized replica of a giant ficus tree, tableaus depicting rubber tapping and a family of Pygmies, and other exhibits illustrating the ecology of the rainforest, the economic exploitation of rainforest resources, and the consequent dangers these practices pose to both local and global environments.

Museum preparators developed and fabricated several dramatic exhibit components, to enhance this exhibition from the Smithsonian Institution Traveling Exhibition Service. These included exhibits exploring the various causes of destruction of the rainforest, and examples of how indigenous rainforest peoples have successfully coexisted in this environment for thousands of years.

A companion exhibit to the Gallery 3 installation was "Tropical Rainforest Album: Insects and Arachnids," shown in the Akeley Gallery. This exhibit featured 40 photographs taken in the rainforests of Costa Rica and Panama.

"African Reflections: Art from Northeastern Zaire," an exhibition of the exquisitely crafted art objects of the Mangbetu people of Zaire, completed a successful debut in Gallery 3 in January. The exhibition moved on to its second stop, the National Museum of African Art at the Smithsonian Institution in Washington, and will continue to tour to other

The Department of Exhibition and Graphics is charged with developing exhibits about human culture and natural history, illustrating the vigorous nature of the Museum's research, and creatively engaging those who visit the Museum each year. The Department fulfills this mission by updating and renovating existing exhibits, creating new permanent exhibits, and designing special exhibitions ranging in scale from a single cabinet to the entire 7,300 square feet of Gallery 3.
sites through 1993.

"Behind the Scenes," explored how the Exhibition Department staff develops and builds exhibits. Featured in Gallery 77 through March, the exhibition included several exhibits that will later be placed in the Hall of Human Biology and Evolution, currently under construction. The Reproductions Department demonstrated the process of casting a mammoth's skull, and Department volunteers gave lectures on diorama foreground fabrication techniques.

UPCOMING SPECIAL EXHIBITIONS

Designs were completed and fabrication begun for "Chiefly Feasts: The Enduring Kwakiutl Potlatch" which will open in Gallery 3 in October. This exhibition will feature large ritual masks and other artifacts, many of which are from the Museum's Northwest Coast collections, in a dramatic presentation of the sumptuous feasts of the Kwakiutl Indians of British Columbia designed to validate a chief's status.

Preparations and designs were initiated for an exhibition on global warming, to open in May in Gallery 3. This exhibition will examine the causes of global climate change and the short and long term effects of these changes. The exhibition is being developed in collaboration with the Environmental Defense Fund.

HALL OF HUMAN BIOLOGY AND EVOLUTION

Designs and preparations progressed for the new permanent exhibition hall scheduled to open to the public in early 1993. Many non-traditional exhibition techniques were developed for the hall, including large holograms, interactive multimedia, animated graphic displays and scale models animated with projected video images. Seven hominid figures, including representations of the *Homo erectus*, Neanderthal and *Australopithecus afarensis* population groups are in production for dioramas, as are most of the low-relief sculptures illustrating the various geologic and phylogenetic relationships over time. Renovations and construction of the physical space that will be the new hall began in June.
PLANNING THE NEW LIBRARY

Based on the “Library Building Program” written last year by Nina Root, chairwoman of library services, the architectural firm of Kevin Roche John Dinkeloo prepared preliminary plans that were refined over several months for the construction and design of the new facility. The final plans include a new eight-story stack building and two remodeled floors of a 1930s building. The new library will allow for expansion and permit logical use and workflow patterns. State-of-the-art environmental controls, compact storage, security, lighting, and electrical systems have been designed to ensure the preservation of collections and afford comfortable space for services, users, and staff.

Extraordinary effort is required to prepare and integrate such a vast collection. The entire Library staff and an army of devoted volunteers were engaged in the massive task of planning the new library and preparing the collections for the move. Presently the collections are dispersed throughout the fourth, fifth, and basement floors in seven of the Museum’s 22 interconnected buildings. To move the collections, detailed plans and procedures are being drawn, and the collections bibliographically and physically prepared. A committee of the Museum scientific staff is working with the Library planning team: Miriam Tam, assistant librarian for technical services; Valerie Wheat, assistant librarian for reference services; Barbara Rhodes, conservation manager; Donald Jacobsen, assistant to the chairwoman; and Ms. Root, in reviewing building plans, recommending arrangement of the collections, and revising procedures and services.

SERIALS AND SPECIAL COLLECTIONS

An INNOVACQ computer system for serials management has been acquired. It is able to produce and maintain an inventory list of the 17,800 titles of the Library’s 230,000 serial volumes by classification number as they will be arranged in the new stacks. This automated system will also serve as an on-line catalog for patrons. The entire serial collection is being reclassified into the Library of Congress system, so it may be integrated in the new facility. Diana Shih, senior cataloging librarian, and Ms. Tam are reclassifying 15,773 titles, and some 200,000 volumes are being relabelled with the new call numbers. A portion of the collection has already been reclassified.

The new public reading room will have space for several thousand reference works that are presently housed in the general stack collection. Sarah Granato, senior reference librarian; Debra Colchamiro, reference librarian; and Ms. Wheat are selecting these materials, and entering bibliographic data and number of volumes into an automated database that will be used to plan space and arrangement of the new reference area. Patrons will have free access to this collection and will no longer have to

The Library, containing one of the world’s greatest natural history research collections, has long suffered from inadequate, ill-designed space. On April 15, 1991, ground was broken for a modern library facility with environmental controls, proper shelving, and updated filing systems to ensure the protection and preservation of the collections, and sufficient space for patrons and staff. The new library is expected to be operational by December, 1992.

Construction workers raise steel beams for the eight-story addition to the Museum’s natural history library.
wait for reference tools delivered from the stacks.

The Special Collections, which include Archives, Art and Realia, and the Film and Photographic Collections, are being reorganized and rehoused in conservationally safe enclosures. Since the Special Collections require regulated climates, the inventories are being revised to provide this relevant information. Andrea LaSala, special collections librarian, is preparing finding guides which will provide easy access to the 750,000 photographic images, 2,000 linear feet of archival materials, over 1,500 pieces of art and memorabilia, and 3,000 film reels and videotapes.

RARE BOOKS

With sufficient space, some 5,000 to 6,000 rare books in the general collection can be identified and finally transferred to the security of the newly designed rare book areas. The Library houses approximately 10,000 rare books. Ms. Root and Library Associate Mary Genett are reviewing the collection and identifying each rare volume. Volunteers then locate these titles in the national databases, transfer the bibliographic data to an in-house database, and edit it to reflect the Library’s unique copy. The rare volumes are placed in secure temporary storage until they are integrated into the Rare Book Collection during the move. The automated database will provide access, serve as an inventory, and will eventually be published.

Since much of the collection is old, fragile, and valuable, considerable effort is being devoted to its safety during the move. Based on Ms. Rhodes’s 1988 condition survey, she and volunteers are making protective enclosures, shrink-wrapping volumes with damaged bindings and other vulnerable materials, and placing unbound serials into pamphlet boxes.

LOANS, EXHIBITS, GRANTS, PROGRAMS

A grant from the National Endowment for the Arts to inventory and prepare condition reports of the Museum’s art collection was received this year. Joel Sweimler, an art historian, has inventoried over 1,000 pieces and identified many treasures, such as a bust by Edmonia Lewis, a noted 19th century half American Black and half American Indian sculptor, and F. Lee Jacques murals from the old Reptile Hall. After the inventory is entered into a database it will be published for distribution to other museums. The inventory was also used in planning the art storage area in the new facility.

Under a grant from the New York State Library preservation program, 1,601 highly flammable nitrate negatives from five early expeditions to Africa were converted to safety film. Nitrate negatives are subject to deterioration and to spontaneous combustion.

Beloit College of Wisconsin borrowed four items from the Central Asiatic Expeditions memorabilia for an exhibit on Roy Chapman An-
drews. The Israel Museum in Jerusalem borrowed a video of "Indian Pottery Making in the Village of San Ildefonso, New Mexico" for an exhibit on archaeology. A videotape of Robert Cushman Murphy's "Birds of Peru and Northern Chile" was loaned to the Yale Peabody Museum as part of the Museum's exhibit "Ocean Birds of South America." Edward Drinker Cope drawings and field diaries were loaned to National Geographic to be photographed for a forthcoming article. An uncolored Audubon plate was loaned to the New York City Police Commissioner's office.

The final exhibit in the old Library Gallery, "Manifest Destiny," was mounted by Ms. Granata. The Library Gallery was closed on March 19, for the renovations. A small exhibit of photographs "Terrible Lizards: Early AMNH Dinosaur Halls" was prepared by Ms. LaSala for a group exhibit at the Museum of Staten Island during Archives Week. Photographs showing early exhibit preparation and mounting techniques were featured in "Behind the Scenes" exhibit in Naturemax Gallery.

Membership behind-the-scenes tours of the Library were conducted on two evenings, and nearly 200 people attended. Ms. Wheat presented a membership program during Archives Week "The Museum and the Magic Lantern," and Ms. Root presented "Monsters" as part of the lecture series.

During an inventory of Museum memorabilia, 10 political cartoons from the Theodore Roosevelt collection of the Harvard University Widener Library were discovered. The cartoons had been loaned to the Museum in 1961, and have since been returned to a grateful Harvard thirty years later.

**SERVICES**

While finalizing and implementing plans for the new library, the Library staff provided information and services to the Museum staff, scientific community, students, and others outside the Museum. The uniqueness and value of the collections are demonstrated by the diversity of users and queries.

The Director of the Mongolian State Central Museum researched the Photographic Collection and chose 1920s and '30s images of Mongol life and costumes. Due to military and political upheavals, such documentation is not available in Mongolia. Reproductions from the Rare Book Room were used by Abbeville Press for the forthcoming "Next to Nature: The Art of Bird Illustration." Richard Ellis did extensive research in the collections and Rare Book Room for his book "Great White Shark." Members of the Fourth Floor Renovation Group use the Library's resources to aid in the reconstruction of fossil skeletons. Edward Burridge researched photographs of mules for a prop in the play "Mule Bone." Numerous television producers used footage from the Film Collection.

The Library served 9,817 patrons (fewer than the previous year since the Museum is now closed Wednesday evenings), answered 32,500 reference questions, circulated 45,194 items, photocopied 13,524 pages, received 1,422 interlibrary loan requests from other libraries, borrowed 420 items for the staff, and performed 38 database searches. It processed 7,663 photographic orders, realizing an income of $70,332, and granted $5,400 in gratis permissions. It filled 37 orders for film footage, realizing an income of $13,535.

Additions to the collections included 2,156 monograph titles, 37 new serial titles, 12,374 serial issues; and 27,370 cards were filed in the public catalogs. Ten large collections of photographs, films, and archives were added to Special Collections, as well as the silver-plated shovels used in the ground-breaking ceremony for the new library.

35,371 issues of Museum scientific publications and Recent Publications in Natural History were distributed, 1,575 volumes were bound, 101 fragile and rare volumes were photographed for general circulation, 812 enclosures were made, and numerous items of art and memorabilia were mended and wrapped.

**STAFF ACTIVITIES**

Ms. Wheat served on the local arrangements committee for the 1991 New York Library Association annual meeting. Ms. Root presented a lecture at the New York Public Library, "History of Natural History Illustration," in conjunction with its exhibit "Creatures of Land, Sea, and Air."
COLLECTIONS MANAGEMENT

COLLECTIONS IMPROVEMENT

Two major grants were received from the National Endowment for the Humanities (NEH) in connection with the department's ongoing program of collections preservation and documentation. With funding from the first grant, construction began on the department's second compact storage facility. During the next three years, the balance of the North American ethnology collection will be computerized and moved into this new 5,000-square-foot facility under the supervision of Collections Manager Paul F. Beelitz. This follows on the completion of the move of the African, Tibetan, Siberian, Eskimo, and Northwest Coast ethnology collections to the department's first compact storage facility. More than 60,000 computerized records were generated for the items in this new storage, and the research potential of these collections is now fully realized through the combination of proper storage and computerized records.

The second NEH grant was awarded in support of the pioneering project of creating digital images of the objects in the Northwest Coast and Eskimo ethnology collections. Under the supervision of William H. Weinstein, system analyst, this innovative enterprise was initiated with the support of The Howard Phipps Foundation and The Andrew W. Mellon Foundation. The digital images in the new database allow researchers to browse through the collection on a computer monitor without physically disturbing the material. The procedure enormously reduces both wear and tear on the objects, as well as the expenditure of staff time. The images and the data associated with them will be made available to researchers and staff through the department's newly installed Local Area Network.

ARTIFACTS AND TEXTILE CONSERVATION

The department's objects conservation laboratory conserved some 185 artifacts from the collections. Most of these are destined for exhibition in "Chiefly Feasts;" however, some South American artifacts received conservation treatment for the exhibition, "Tropical Rainforests: A Disappearing Treasure." A set of Eskimo artifacts displayed in "Arctic Art" also received attention, as did a set of New Guinea bone artifacts, which will be loaned to the Metropolitan Museum of Art for exhibit. Conservation attention to materials on permanent display at the Museum has centered on paper artifacts, such as the Sioux drawings in the Hall of Indians of the Plains.

Two grants were awarded to the objects conservation laboratory dur-
ing the year. A NEH planning grant was received in connection with the proposed exhibit of the Nootka Whale Shrine. This remarkable artifact set is made of wood that has become degraded and requires consolidation.

In addition to the conservation of objects, the laboratory also continued its emphasis on the training of conservators. The second grant, awarded by the Getty Grant Program, is to provide practical internship training for conservators who have attended a graduate conservation program.

The focus of the textile conservation program continued to be on the new storage for the Andean archaeological collection, now largely housed flat in new cabinets, and organized by culture and period. This new facility is an innovation that has elicited inquiries from a wide range of sister institutions.

Conservators prepared textile pieces for two major loans, and the textile conservation training program continued to be active. In addition to in-house training, lectures and demonstrations were offered to students and professionals from all over the world.

### INTERDEPARTMENTAL FACILITIES

The Interdepartmental Facilities include the shared computer facility and the scanning electron microscopy (SEM) laboratory. Technical support is provided to the Museum community by two staff members.

This spring, plans were made to add remote network access capability to the Macintosh computer which will allow users to send electronic mail to other computer users throughout the world. The first steps in this plan were the purchase of a 9,600 bit per second modem and installation of the appropriate software. The Macintosh already has a document scanner and optical character recognition (OCR) software. The system, located in the fifth floor computer room, is available to all Museum staff.

The Facilities' Wang VS 7120 computer system now has more than 85 attached terminals and PCs as well as 18 printers located throughout the Museum. This winter a one gigabyte (1,000 megabyte) disk drive was added, which doubled the total online storage capacity of the system.

A new database was created to help track benefit events. Enhancements were made to existing databases used by Micropaleontology Press, the Department of Mammalogy, and Discovery Tours. In addition, technical computer assistance was provided to the Development Office, the Financial Office, Purchasing, Library Services, and the Departments of Herpetology and Ichthyology, Mineral Sciences, and Vertebrate Paleontology.

New software that enables attached PCs to transfer and convert files to and from the Wang computer system was added in early summer.

The departments making use of this new capability include the Financial Office, General Accounting, and Public Affairs.

The SEM laboratory consists of a Zeiss scanning electron microscope (SEM), a LINK energy dispersive microanalysis system (EDS), a back-scattered electron detector, a color video copy processor, and equipment used in preparation of SEM samples, including a sputter coater and a critical point dryer.

The SEM is used extensively by many different scientific departments. Members of the Entomology Department used the SEM to study spiders, flies, beetles, bee cocoons and moth tongues. Ichthyologists determined structural differences in the teeth of various species of Central and South American fishes. The structures of marine organisms were studied by curators from the Department of Invertebrates. Mammalogists examined the structure of rodent tooth rows and individual teeth. Members of the Department of Vertebrate Paleontology used the SEM to examine fossil teeth.

The microanalysis system was used to help members of the Department of Anthropology determine the effects of materials used to clean artifacts. Mineral Scientists also made use of EDS to determine elemental composition of meteorite samples.
The Grants and Fellowships Programs broaden the Museum's base of scientific investigation and reinforce its commitment to the education and training of scientists. These programs support investigators in the scientific disciplines represented in the Museum. Since its inception seven years ago, the highly competitive Fellowship Program has supported 41 postdoctoral scientists engaged in independent research either at the Museum or one of its field stations. The Doctoral Training Program, an educational partnership with selected universities, is dedicated to the training of Ph.D. candidates. The Museum has joint programs with Columbia University, providing students opportunities in vertebrate and invertebrate paleontology, anthropology, molecular biology, and mineral sciences; Cornell University in entomology; and City University of New York in evolutionary biology. A newly signed agreement with Yale University will permit students to study molecular biology/systematics, beginning fall 1991.

The Grants Program supported 248 predoctoral candidates and postdoctoral investigators. The program awarded 53 Frank M. Chapman Memorial Grants in Ornithology; 79 Lerner-Gray Grants for Marine Research (two of which are partially supported by the Donn Rosen Fund); 72 Theodore Roosevelt Memorial Fund Grants in North American zoology and paleozoology; and two Southwestern Research Station Student Support Grants.

Collection Study Grants, which enable students and recent postdoctoral investigators to visit the Museum's scientific collections, enabled 42 researchers to visit the Departments of Anthropology, Entomology, Herpetology and Ichthyology, Invertebrates, Mammalogy, Ornithology, and Vertebrate Paleontology.

The Research and Museum Fellowship Program funds recent postdoctoral investigators, established scientists, and other scholars, to carry out specific research projects, over a period of one or two years. This year 13 Research Fellows were in residence. From the Department of Anthropology, Paul Goldstein, a Boeschenstein Research Fellow, investigated the Tiwanaku civilization of the South Central Andes and Christopher Steiner, a Kalbfleisch Research Fellow, examined the current organization of the art market in Côte d'Ivoire, West Africa. David Yeates, Roosevelt Research Fellow in the Department of Entomology, studied the relationships within one of the most diverse families of Diptera, the beetles.

Vladimir Ovtsharenko, curator at the Zoological Institute of the Academy of Sciences in Leningrad, accepted a six-month appointment as a Weatherhead Research Fellow in the Department of Entomology. He devoted his time to the study of Gnaphosidae family spiders of the North Asia region. In the Department of Herpetology and Ichthyology, Linda Ford began her second year as a Kalbfleisch Research Fellow. She investigated the interrelationships of the dart poison frogs (Dendrobatidae) based on osteology and myology. Maureen Donnelly began a nonconsecutive, second year appointment as a Boeschenstein Research Fellow. She studied the diets of the poison-dart frogs to illustrate the varied feeding habits within the family Dendrobatidae.

Roderic Page, a member of the Department of Herpetology and Ichthyology, accepted an appointment as a Thorne Research Fellow. He is engaged in interdisciplinary research developing methods for biogeographic analysis, including the design of a computer program. Nancy Simmons, a Kalbfleisch Research Fellow in the Department of Mammalogy, studied the origin of bats and their relationships to other mammals.

Boeschenstein Research Fellow Robert Fogel began his second year appointment in the Department of Mineral Sciences, and is investigating the solubility of carbon in magma (molten rock) to understand the role of gases in volcanism. Yongshan Dai, a Kalbfleisch Research Fellow in the Department of Mineral Sciences, is studying the structural relationships of svabite, johnbaumite, and turneaureite, including their three-dimensional atomic arrangements. Xiaoming Wang, a Frick Research Fellow in the Department of Vertebrate Paleontology, focused on the early evolution of North American Hesperocyonine canids, a group whose modern representatives are wolves, dogs, and foxes.

Two Chapman Research Fellows began second year appointments in the Department of Ornithology. Richard Prum investigated phylegy and behavioral evolution in two families of neotropical birds,
manakins (Pipridae) and cotingas (Cotingidae). Jeff Woodbury explored evolutionary relationships between families and orders of birds by examining their central nervous systems.

The Curatorial Fellowship Program enables individuals holding doctoral degrees or equivalents to assume all the duties and responsibilities of members of the curatorial staff for a limited term appointment not to exceed five years.

James Miller began his fourth year appointment as Kalbfleisch Assistant Curator (Fellow) in the Department of Entomology. His research focused on the revision of the genera of the neotropical subfamily Dioptinae (Lepidoptera: Notodontidae). This included host plant associations and diurnal behavior. Recently, Dr. Miller received Na-
Paul S. Goldstein, scientific assistant and former Boeschenstein Research Fellow, completes a rendering of the Omo temple (circa A.D. 850), in southern Peru, where he directed excavations in 1990.

tional Science Foundation support to complete his work.

The Doctoral Training Program supports the education of graduate students enrolled in Ph.D. programs at universities where the Museum has entered into a joint training agreement. Ten students are currently supported by this Museum in this program. Gregory Edgecomb, who completed his Ph.D. requirements this year, and Bruce Lieberman worked with Niles Eldredge, chairman and curator of the Department of Invertebrates; Sherri McGehee is conducting her project in the Department of Vertebrate Paleontology under the supervision of Dean of Science Michael J. Novacek; Gina Gould is working with Assistant Curator Mark A. Norell in the Department of Vertebrate Paleontology; Cheryl Peach and Robert Hutchinson are partially supported this year by National Science Foundation (NSF) grants to Edmond A. Mathez, assistant curator in the Department of Mineral Sciences. All are doctoral candidates in the Department of Geological Sciences, Columbia University, and conduct their research at the Museum. Pablo Goloboff, of Cornell University, and Priantha Wijesinghe, of City University of New York, worked with Norman I. Platnick, curator in the Department of Entomology. Paul Vrana, from Columbia’s Department of Biological Sciences, worked with Ward Wheeler, assistant curator in the Department of Invertebrates/Molecular Biology Laboratory. Patricia Escalante, who worked with François Vuilleumier, chairman and curator in the Department of Ornithology, is near completion of her Ph.D. at City University of New York.

The Research Experiences for Undergraduates (REU) Program, now in its second year, immersed eight students in a highly interactive research environment centered around the theme of evolutionary biology. Supported by a NSF grant to Melanie Stiassny, assistant curator in the Department of Herpetology and Ichthyology, this exciting summer internship program gave students direct exposure to the life of a research scientist, and helped them make critical career decisions.

The programs for Grants and Fellowships are made possible through the generosity of many donors and grants from funding agencies: Boeschenstein Fund, Frank M. Chapman Memorial Fund, Greenwall Fund, the Lincoln Ellsworth Fund, Hoffman Research Fund, Franklin H. Kalbfleisch Endowment Fund, Lerner-Gray Fund for Marine Research, the National Science Foundation, Theodore Roosevelt Memorial Fund, Donn Rosen Fund for Ichthyology, Rudin Fund, Southwestern Research Station Student Support Fund, Thorne Fund, the Anthony and Madeline W. Traina Fund, and the Weatherhead Fund for Asian Studies.
In the past year, scientists, anthropologists, and other scholars filled the pages of *Natural History* with lively accounts of their findings in biology, paleontology, astronomy, and human culture.

Highlights included zoologist Ed Gregory's "Turned-on, Tuned-in Platypus," describing the newly discovered electrical sensors in that mammal's bill. Marine ecologist John T. Hardy's "Where the Sea Meets the Sky," described the ocean's vulnerable, microscopically thin surface layer—the layer which supports its own animal and plant community, and on which the health of all our oceans depend. Anthropologist Rod Cardoza offered a close-up portrait of Shiite Muslim cultural life in "The Ordeal of Moharram," and folklorist Ian Russell explored the roots of English Christmas caroling in "Queuing to Carol."

Two issues, noteworthy for special features, detailed in-depth studies of the ecological effects of global politics and power struggles. In September, historian Michele Stenehjem wrote of decisions agreed to by scientists and administrators of Washington's Hanford Engineer Works, which produced plutonium for atomic weapons between 1944 and 1986. This plutonium released radionuclides into the Columbia River. The public was not informed of the known dangers.

In November, a special section, "The Ecology of War and Peace," spotlighted the environment as the overlooked victim of war, in an essay on the impact of the Vietnam, Nicaraguan, and other wars on the Earth and its wildlife.

In anticipation of the quincentennial of Columbus's arrival in the Americas, anthropologist Samuel Wilson has begun "Worlds in Contact," a series looking at the Europeans' arrival in the Americas from the viewpoint of those already living here when the Italian explorer arrived. The first article to appear, "Columbus, My Enemy," told the story of Guacanagari, the Taino chieftain who resisted Columbus's incursions into what is now Hispaniola. Two more articles have followed, and the series will continue to appear in the magazine through 1992.

This year also saw the launching of another series, "The Maya Rediscovered," in which archeolo-
gists and other scholars have been writing about new discoveries and interpretations of the great New World civilization that mysteriously declined around A.D. 1000. The series will also continue through next year.

In recent decades, scientists have listened to, recorded, and analyzed the wide range of signals made by marine mammals. “Symphony Beneath the Sea,” a 32-page section in the March issue, was devoted to communication and hearing in whales, seals, and walruses.

A number of features came from contributors affiliated with the Museum. Richard G. Van Gelder, curator emeritus in the Department of Mammalogy, wrote “An Uplifting Tail,” on the logistics of capturing skunks, and “A Big Pain,” which speaks of the health problems of the legendary circus elephant, Jumbo. Jumbo’s skeletal remains are currently mounted in the Museum. Stanley A. Freed and Ruth S. Freed, curator and research associate, respectively, in the Department of Anthropology, wrote “Taraka’s Ghost,” an account of a young girl in North India for whom marriage imposed almost unbearable psychological conflicts.

“Life in Antarctic Depths,” by Judith E. Winston, associate curator in the Department of Invertebrates, told of the slow-growing, long-lived organisms that form the complex animal community on the floor of the Southern Ocean.

While working in the Vertebrate Paleontology department of the Museum in 1990, Jian Guan, chief of mammal research at the University of Beijing, wrote “The Dragon Bones of Tongxin,” regarding the mastodon fossils of northern China.

Museum history was featured in “Pictures from an Expedition,” excerpts from the memoirs of Museum ornithologist James Chapin, who along with Herbert Lang, headed the Museum-sponsored expedition to the Belgian Congo (1909-1915).

Columnists Stephen Jay Gould (“This View of Life”), Raymond Sokolov (“A Matter of Taste”), and Robert Mohlenbrock (“This Land”) contributed monthly essays.

Natural History’s advertising revenue for 1990-1991 was $5.9 million, as measured by Publishers Information Bureau. Average paid circulation was approximately 515,000 in the June report of the Audit Bureau of Circulation.

The audience of the magazine, which consists primarily of Museum members, represents an important constituency and potential market. Museum members help support the work of the Museum through their dues and additional contributions,
as well as by their purchase of Museum books, products, and participation in Museum tours and programs.

**DISCOVERY TOURS AND CRUISES**

The Museum's educational travel department sponsored cruises and land programs, which parallel Museum research and exhibitions, to more than 40 countries during the past year. Sixty-four speakers, including Museum and guest lecturers, presented multimedia lectures, led informal discussions, and held question and answer sessions covering geology, ecology, natural history, art, anthropology, and astronomy. The Museum's teams of distinguished researchers and educators were joined by local guides and nearly 900 Museum members in exploring archeological sites, cultural centers, and wildlife regions around the world. Some of the highlights were:

- Traveling into the jungle mountains of Sulawesi to the home of the Toraja to see their boat-shaped houses.
- Exploring Aldabra Atoll in the Indian Ocean, home to giant tortoises and the unique Aldabran brush warbler.
- Viewing prehistoric cave art in the Ice Age caves of the Dordogne valley in France.
- Camping among the wildebeest of the Serengeti during their annual migration.
- Studying temples and stelae built by the ancient Maya in the jungles of Central America.
- Searching the Highlands of Papua New Guinea for birds of paradise and bowerbirds.
- Walking among the ruins of the ancient Ionian city of Ephesus in Turkey.
- Cruising on an ice-breaker to Antarctica, the Falklands, and South Georgia.
- Enjoying close encounters with "friendly" gray whales and humpbacks in the lagoons of Baja California.

Post-tour surveys of participants showed a high level of satisfaction with the programs and an increased level of appreciation of the Museum's educational and research mission.

**MEMBERSHIP**

A variety of distinguished guest lecturers appeared at the Museum under the auspices of the Membership Office. Primatologist Jane Goodall discussed her long-term study of the wild chimpanzees of Tanzania and ethnobiologist Darrel Posey profiled the scientific activism of Brazil's Kayapo Indians. Nobel laureate James D. Watson,

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The Museum's "dinobooth" at the Columbus Avenue Fair, a major community event, sold a variety of items from the Museum Shop and distributed information on membership opportunities, programs, and events.
The codiscoverer of the structure of DNA, described his pioneering work in genetics research and offered projections on the future of biomedicine. Other programs offered insights into Maya achievements in astronomy, the prehistoric artistry of the caves of Lascaux, and a commemoration of the 100th anniversary of the massacre at Wounded Knee.

Resident scientists also discussed their work at Membership programs. Among these presentations were shows by Curator of Anthropology Enid Schildkrout, who discussed the curatorial oversight of the "African Reflections" exhibition; herpetologist Michael W. Klemens, who described international efforts to save threatened and endangered turtles; and Michael J. Novacek, vice president and dean of science, who chronicled Museum expeditions past and present to the fossil-rich badlands of Outer Mongolia.

Educational field trips around the Greater New York area offered participants an enhanced perspective on local ecology. Members received a first-hand view of Museum research at the field station on Great Gull Island, where researchers discussed their studies of the common tern. Other trips included a whale watch on Long Island Sound, tours of the city's water supply and pollution control system, educational family cruises along the Hudson, and walking tours of several geological points of interest, including Wall Street, Inwood Hill Park, and Montauk Point.

Among the many Members' workshops were programs on human evolution, which featured a viewing of early hominid casts from the Museum's collections. A dinosaur workshop offered up-to-date information from Museum paleontologists, along with a chance to examine authentic specimens. Children's workshops included a "Chemistry for Kids" program that combined lectures and lab experiments.

During the course of the year, attendance at 78 programs totaled nearly 18,000. The introduction of simultaneous interpretation for the hearing-impaired at major presentations this year assisted many attendees.

The monthly newsletter Rotunda, which has a circulation of 39,000, keeps members apprised of Museum activities.

Total revenue from the Museum's Participating and Donor Membership Program was approximately $1.5 million.

**Museum Shop**

The Museum Shop has increased the portion of merchandise that reflects concern for the environment. There is a wide selection of recycled paper products, educational games and kits, and an extensive array of books, posters, and other items with environmental themes.

The Gallery 3 Shop for the Rainforest exhibit was a strong example of our success in promoting environmentally related merchandise. The Shop's motif of tropical trees and vines carried out the theme of...
the exhibit and received a very positive response from our visitors. Many unique merchandise items came from Africa, Asia, and South America.

In addition to a Rainforest shop, the Gallery 3 retail area housed merchandise coinciding with the exhibit “African Reflections: Art From Northeastern Zaire” The Shop featured crafts, jewelry, and books, including a catalog by Museum Curator Enid Schildkrout and Research Associate Curtis A. Keim.


Youngsters and adults have always found an abundance of merchandise in the Museum’s shops. The selection is being expanded for teenage visitors. More gifts, jewelry, minerals, and clothing are being offered.

The Museum Shop extended its hours on Fridays and Saturdays, which has proved popular with our visitors. Gross sales and royalty income was approximately $2.7 million.

MICROPALeONTOLOGY PRESS

Micropaleontology Press is the world’s major source of reference data on the microscopic fossils used in oil exploration. It is supported by memberships and subscriptions from oil companies, geologic surveys, and universities. The Press delivered three volumes of the Ellis and Messina Catalogues of Micropaleontology, including vol. 92 of Foraminifera, vol. 57 of Ostracoda, and vol. 8 of Diatoms. Also published during the year were vol. 36 of the quarterly research journal Micropaleontology, vol. 19 of the monthly Bibliography and Index of Micropaleontology, and vol. 4 of the nine-part Handbook of Cenozoic Calcereous Nanoplankton.

In April, the Press introduced a state-of-the-art electronic reference system, Micro Base, for recording and managing very large illustrated databases. This system will be used to deliver catalog publications in electronic form and to integrate this database with user-generated proprietary information. The system is being installed throughout the petroleum exploration industry, and is suitable for any specimen-based research.

SPECIAL PUBLICATIONS

“Chiefly Feasts: The Enduring Kwakiutl Potlatch” by Vice-President for Public Programs Aldona Jonaitis was in preparation for co-publication with the University of Washington Press as a glorious companion to the exhibition of the same name.


The Members’ Book Program continues to offer a collection of specially selected natural science books and related gift items to the Museum’s membership, through the annual catalog and advertisements in Natural History magazine.

Now in its 35th year, Curator, the quarterly publication of the American Museum of Natural History, for and by Museum professionals, remains a respected forum for discussion of timely matters of interest to the Museum professional community.
**Administration**

**Building Services**

The department supervised installation of a new Multi-Plex Security Control System, which consolidates the Museum's various intrusion alarm, fire detection, door control, and closed-circuit surveillance systems. The new control center will improve the monitoring and operation of all of the Museum's security systems. This project was supported by the National Endowment for the Arts and The Clark Foundation, with additional funds provided by the Museum.

**Construction**

The Museum continued to work with the construction management firm of Lehrer McGovern Bovis to complete two capital projects—the new Molecular Systematics Laboratory and new office space in the Office of Development. The Museum has also hired the firm for five new capital projects: the major reconfiguration of the Museum's fossil exhibition halls, a new eight-story Library building and renovation of existing Library space, restoration of the Theodore Roosevelt Memorial Hall, the planned Hall of Human Biology and Evolution, and the Department of Entomology's storage facility.

**Maintenance**

A specially designed 25-ton heating, ventilation and air-conditioning system for Museum research laboratories was installed, as were new climate control systems in the Morgan Memorial Hall of Minerals, the Harry Frank Guggenheim Hall of Gems, and the Junior Shop. Air-conditioning upgrades were also completed in the Library, Gallery 3, and the Hall of Mexico and Central America. In addition, preparations were made to implement a central chilled water air-conditioning system.

**Naturemax Theater**

The Naturemax Theater attracted more than 300,000 IMAX film viewers in fiscal 1990-91. Features included "Niagara: Miracles, Myths and Magic," which presented the awesome wonder and majesty of the falls, and "Blue Planet," which showed film footage taken of Earth by astronauts aboard space shuttle missions. The film highlighted some of the pressing threats to our planet's environmental systems.

A dinner/theater package was created, giving visitors the opportunity to attend a Friday or Saturday evening Naturemax feature and have dinner in the American Museum Restaurant for a special price. The package has proved particularly attractive to Museum members.

**Museum Attendance**

Attendance for the 1990-91 fiscal year totaled 2,737,750. This figure includes 2,272,945 to the Museum, and 464,805 to the American Museum-Hayden Planetarium.
DEVELOPMENT

Fiscal 1990-1991 may be viewed with pride as a year of significant accomplishment. June 30, 1991 marked the end of the first full year of the Campaign for the American Museum of Natural History, with more than $29 million in gifts and pledges received. More than $14 million in cash was received from trustees, members, corporations, foundations, estates, and government agencies.

Preliminary fund-raising for the campaign began without fanfare during the winter of 1989-1990. Focuses of the campaign include renovation of the Museum's famed dinosaur and other vertebrate fossil halls, construction of a new eight-story natural history library building, and support for other projects such as the new Hall of Human Biology and Evolution, several special exhibitions (e.g., “Chiefly Feasts” and “Global Warming”), a range of scientific research projects, education initiatives, and expeditions to Cuba and Mongolia.

General operating support remained a top campaign priority. Gifts made without restriction on their use are vital to the ongoing operation of the Museum, as well as to allow the institution to respond to unanticipated opportunities, and address widely divergent needs such as education programming, and collection acquisition and conservation.

The Museum officially began counting gifts and pledges toward the campaign on July 1, 1990, and followed with a public announcement at a well-attended press conference in November. The Museum's revitalization plans for the next five years were unveiled and widely reported by the media.

The momentum could not have been attained without a number of exceptional trustee, corporate, and foundation leadership gifts. These include Exxon Corporation's gift of $2.5 million, and $2.5 million from Museum Board Chairman William T. Golden. Through Museum Trustee Mrs. Constantine Sidamon-Eristoff, a gift of $2 million was made by the Howard Phipps Foundation. The J.M.R. Barker Foundation contributed $1 million, and two anonymous $1 million commitments were received. These gifts recognize the distinctive stature of the Museum as a dynamic research facility, as a center for advanced study and scholarship, and

An eye-catching advertisement created by Grey Advertising announced the Campaign for the American Museum of Natural History with the phrase, “Big things are in store, Dinosaur.”
Discussion were begun with long-time corporate contributors about major campaign support, and notable was the Mobil Corporation's gift of $400,000. Many other corporations, recognizing the importance of ongoing operational support, significantly increased their commitments over previous levels. Others were encouraged to become first-time participants in the corporate giving program.

Similarly, foundations responded generously to the Museum's appeal, providing almost $2 million. The John D. and Catherine T. MacArthur Foundation pledged $650,000 in support of the major exhibition on global warming that will open at the Museum in May, 1992. The Geraldine R. Dodge Foundation made two gifts of $50,000 each in support of the educational elements associated with the global warming exhibition. The William Randolph Hearst Foundation pledged $250,000 toward the fund-raising campaign. Generous gifts were also received from the Edward John Noble Foundation, the W. Alton Jones Foundation, the Booth Ferris Foundation, and the Ambrose Monell Foundation.

Through the foresight of Mrs. Lucy G. Moses, the Museum was the beneficiary of a bequest totaling more than $3 million. The Museum is also grateful to The Wallace Funds-New York Community Trust for its $475,000 in support during the year toward the renovation and construction of the Hall of Human Biology and Evolution.

The new Friends of the American Museum of Natural History, under the leadership of Mrs. Sidamon-Eristoff,
concluded its first full year, sponsoring two educational evenings and a luncheon lecture. In one of the events, Michael J. Novacek, vice president and dean of science, presented the findings of the research team that had recently returned from its first expedition to the Gobi Desert. At the other, Ian M. Tattersall, chairman of the Department of Anthropology, and J. Willard Whitson, exhibition designer, treated guests to a sneak preview of the Hall of Human Biology and Evolution. The Friends' April luncheon and lecture on the environment featured as speaker Thomas E. Lovejoy, assistant secretary for external affairs at the Smithsonian Institution. It was chaired by Mrs. Robert Garrett.

Two highly successful fund-raising events were also held, generating more than $350,000 for the Museum. The December gala chaired by Mrs. Richard M. Kessler celebrated the opening of the exhibition “African Reflections.” The February “Night in the Sea” buffet supper and dance was jointly chaired by Mrs. David McDonald and Mrs. Douglas Bratton.

PUBLIC AFFAIRS

Local and national awareness of the Museum's research and education programs, special events, and special and permanent exhibitions was heightened through articles and advertising in print and broadcast media.

In November, the Public Affairs Office organized a press conference at which the Museum's fund-raising campaign and construction program were publicly announced. At the event, hosted by President Langdon, Mr. Golden, Dr. Novacek, and Aldona Jonaitis, vice president for public programs, plans to completely reorganize and restructure the Museum's unparalleled fossil halls and construct an eight-story addition to the Library were presented.

Reports on these important projects appeared in major newspapers including The New York Times, the New York Post, the New York Daily News, Newsday, the Newark Star Ledger and the Boston Globe. Features on the subject aired on WNBC and WNYWTV.

Interest in the Museum continued through the year, with national coverage of project highlights by Discover, the New Yorker, the Associated Press and other media organizations.

Special exhibitions, among them “Behind the Scenes” and “Tropical Rainforests: A Disappearing Treasure,” were also the focus of media interest. “Blue Planet,” a Naturemax film using footage shot on space shuttle missions to show the fragile magnificence of the Earth, garnered attention as well. The coverage of “Tropical Rainforests” and “Blue Planet” increased attendance at these programs, and also helped to improve public awareness of the Museum's commitment to environmental concerns.

Scientific achievements by the Museum's scientists were the subjects of print and broadcast articles. A New York Times story discussed the launch of the Museum's three-year expedition to Outer Mongolia to search for dinosaurs and other fossils. Discovery of a previously unknown primate in Cuba was also covered by the media. Rediscovery of a species of desert fish thought to be extinct generated much media excitement and focused attention on the endangered status of hundreds of rare desert fishes.

New York City councilmembers and New York State legislators and their families attended “Legislators Night,” designed to familiarize state and local legislators with the Museum's programs and exhibitions. The evening featured special screenings of “Blue Planet,” origami teaching tables, tours of “Behind the Scenes,” and a buffet dinner.

The Grey Advertising Agency was engaged to create an expanded advertising program highlighting both special and permanent attractions, and emphasizing the Museum's role as a premier New York attraction. Full-page ads in The New York Times, New York magazine, and other publications were planned, as were bus shelter ads in the five boroughs of New York City.
The Office of Guest Services maintains the schedule of all programs and events held in Museum exhibition halls, theaters, and lecture and meeting rooms by Museum departments and outside groups. The office also coordinates the Museum service personnel and equipment necessary to carry out these activities.

The Museum's varied facilities are used throughout the year for school and camp groups, workshops, music and dance performances, scientific lectures, product launches, press previews, symposiums, and corporate events.

This year, assistance provided by Guest Services for Museum events included symposiums presented in association with the exhibitions "African Reflections: Art from Northeastern Zaire" and "Tropical Rainforests: A Disappearing Treasure"; the Department of Education's "Girl Scout Camp-In"; members' dinosaur workshops and Jane Goodall lectures; the annual Margaret Mead Film Festival, and the Mack Lipkin Man and Nature Lectures.

Guest Services handled arrangements for numerous social and press events held in connection with the openings of the temporary exhibitions, "Behind the Scenes," "Tropical Rainforests," "Pre-Hispanic Foods of Mexico," and the "Origami Holiday Tree," as well as for the opening of the Naturemax film "Blue Planet."

The Museum hosted the 75th Anniversary and 71st Annual Meeting of the American Society of Ichthyologists and Herpetologists, held from June 15 through 20.

Other groups that held special events at the Museum included the American Association for the Advancement of Science, Department of Cultural Affairs of the City of New York, Cultural Institutions Group, Goldman Sachs & Co., B.A.T. Industries, Marine Midland Bank, and the American Association for the Advancement of Science.


 Programs developed and implemented by Guest Services were the September Senior Citizens Month, which offered special programs and discounts for senior citizens, and the Dinner/Naturemax Theater Package that promotes the Museum's late night Friday and Saturday hours. Both programs were very well received, bringing new interest and audiences to the Museum. The successful group tour package program, which offers a full agenda of Museum activities, is also administered by Guest Services.

 Among the filming and photography projects shot at the Museum through Guest Services were a Suntory television commercial, a film for Japanese corporations which showed creative ways to attract new business by focusing on the Museum's Dinner/Naturemax Theater package, and a documentary on meteorites to be broadcast on Austrian television. In addition, the office also handles arrangements for the numerous news media tapings initiated by the Office of Public Affairs.

 This year the Food Express served 590,028 meals, the American Museum Restaurant served 36,326 members and visitors, and the Employees' Dining Room provided 90,970 employee breakfasts and lunches.
Volunteers

More than 700 people volunteer at the Museum, and more than half work with the public; others work behind the scenes or at the Museum’s research stations. The volunteers range in age from 18 to 80, and the majority of them hold bachelor’s degrees or above.

The Volunteer Office placed 135 new applicants throughout the Museum this year. Volunteers contributed more than 100,000 hours of service to the Museum and were responsible for more than $235,000 in sales of shop items, memberships and tickets.

Awards and Recognition

The Volunteer Office staff created a new category of volunteer status. Until this year, volunteers were listed as inactive when they retired from their Museum work. Now, volunteers who have served the Museum for five years or more will become volunteers emeriti when they retire. By renewing their volunteer badges each year, these volunteers can continue to enjoy the privileges of being a Museum volunteer. Two people who retired this year, Leys Parker after 13 years of service, and Margaret Tobin after eight and a half years at the Museum, are the first volunteers emeriti. Volunteers who retired before the new program was created are being invited to become volunteers emeriti.

Museum Tours

Tour guides gave 2,385 Highlights Tours to approximately 30,000 visitors. They were also stationed in Gallery 77 to answer questions about the special exhibition, “Behind the Scenes,” which explained the ways in which Museum dioramas and exhibitions are created.

Other special exhibitions such as “African Reflections: Art from Northeastern Zaire” and “Tropical Rainforests: A Disappearing Treasure” were the subjects of half-hour gallery tours given by the guides to more than 800 visitors. The guides also gave tours in these exhibitions to nearly 1,000 Museum members.

In addition to the popular Highlights Tours, a new tour program was established. The new tours provide in-depth examinations of specific topics including “Whales and Dolphins,” “Siberia,” “Jade, Gold and Pearls,” and “Mayan Civilization.” The tours give a comprehensive look at an intriguing subject for the first-time Museum-goer, and give the repeat visitor the opportunity to learn about a different aspect of the Museum on each visit.

Other Activities

Volunteers contributed many hours to special programs and projects. They helped conduct surveys of the public, and staffed day-long symposia and evening benefits. Volunteers spent the night for the Girls’ and the Boys’ Camp-In, and participated in Membership events and education programs. In a cooperative venture with Central Park, volunteers logged large numbers of hours during “You Gotta Have Park.”

At the annual Volunteer Reception, volunteers from selected departments were honored for outstanding service during the past year. Their names are as follows: Bill Glover, Sol Heiligman, Irwin Levy, Sylvia Lilienfeld, John Rowan, Esther Schlanger, Eleanor Schwartz, Margaret Tobin, Tammy Weintraub and Barbara Worcester. Michael Shall, the Museum’s volunteer origami specialist who orchestrates the production of the Origami Holiday Tree, was also recognized.

The Origami Teaching Tables program held every winter at the Origami Holiday Tree was expanded to include a spring session in March and April when visitors folded origami models appropriate to the season such as butterflies, birds, bunnies and tulips.
Scientific research requires fluid communication of results. As fields change rapidly, publications must be generated and dispersed within a very short time frame. But this tempo must not reduce the quality of the published work. Research periodicals and monographs, like the Museum’s Novitates and Bulletin series, are subject to a gauntlet of outside peer review and editorial refinement. Investigations often involve very detailed descriptions of anatomical architecture. Accordingly, the Museum series incorporates some of the world’s finest technical illustrations and photographs in the natural sciences. During the past 10 years, 40 staff curators and curators emeriti have contributed some 2,500 research papers and books. A comparable suite of publications has been contributed by research associates, postdoctoral fellows, students and scientific assistants. This body of published work represents a formidable influence in public education as well as in the scientific community. The publications listed by department on the following pages were published between July 1, 1990, and June 30, 1991, the period covered in this Annual Report.

Michael J. Novacek
Dean of Science


DEPARTMENT OF ANTHROPOLOGY

Scientific Publications:

Bennett, W. J., Jr., and J. H. Schwartz

Bettinger, R. L.


Carneiro, R. L.


Clarke, R. J.


deLaguna, F.


Dole, G. E.

Eden, A. R., J. T. Laitham, and P. J. Gannon

Edgren, S.

Fisher, H.

Freed, R. S., and S. A. Freed

Fresia, A., C. R. Ruff, and C. S. Larsen

Goldstein, P.


Goldstein, P., M. P. Berman, and L. Watanabe M.

Goldstein, P., J. E. Buikstra, A. Pasinanski, M. Lozada C., and L. Hoshowitz

Goldstein, P., M. E. Moseley, R. A. Feldman, and L. Watanabe M.

Gould, R. A.

Grayson, D. K.


Grayson, D. K., C. Musser, and Z. Musser

Groves, C. P., and I. Tattersall

Hutchinson, B. L., and C. S. Larsen
Hyslop, J.

Jaffe, W. L., P. J. Gannon, and J. T. Laitman

Larsen, C. S.


Larsen, C. S., and M. A. Kelly

Larsen, C. S., R. M. Matter, and D. L. Gebo


Larsen, C. S., R. Sherryt, and M. C. Griffin

Mithen, G. R., and C. S. Larsen

Pate, F. D., J. T. Hutton, R. A. Gould, and G. L. Pretty

Reidenberg, J. S., and J. T. Laitman


Roscoe, P. B.


Roscoe, P. B., and R. Scaglion

Ruff, C. B., and C. S. Larsen

Russell, K. F., Inui C., and C. S. Larsen

Schildkrot, E.

Schoeninger, M. J., N. J. van der Merwe, K. Moore, J. Lee-Thorp, and C. S. Larsen

Schwartz, J. H.


Simpson, S. W., D. L. Hutchinson, and C. S. Larsen


Steiner, C. B.


Tattersall, I.

Tattersall, I., and J. H. Schwartz

Thomas, D. H.


Thomas, D. H. (ed.)


Wolfson, V. P., and J. T. Laitman

Abstracts, Reviews, and Popular Publications:

Beelitz, P.

Brauer, J. L.

Carneiro, R. L.

Dole, G. E.

Eden, A. R., P. J. Gannon, and J. T. Laitman

Freed, S. A.

Freed, S. A., and R. S. Freed

Friedland, D. R., P. J. Gannon, A. R. Eden, and J. T. Laitman


Gannon, P. J., K. J. Chandross, and J. T. Laitman

Gannon, P. J., T. Laitman, K. J. Chandross, and A. R. Eden

Gould, R. A.

Grayson, D. K.


Herr, A. M., P. J Gannon, I. Sanders, A. R. Eden, and J. T. Laitman


Keim, C. A.

Kendall, L.


Laitman, J. T., J. S. Reidenberg, D. R. Friedland, and P. J. Gannon


Laitman, J. T., J. S. Reidenberg, P. J. Gannon, B. Johansson, K. Landahl, and P. Lieberman

Larsen, C. S.

Larsen, C. S., C. B. Ruff, and R. L. Kelly

Miller, T. R.


Moore, S. M., and J. T. Laitman


Reidenberg, J., S., and J. T. Laitman


ASTRONOMY AND PLANETARIUM

Abstracts and Popular Publications:


DEPARTMENT OF ENTOMOLOGY

Scientific Publications:


Grimaldi, D. A. (ed.)

Grimaldi, D. A., and J. Maisey

Griswold, C. E.

Heed, W. B., and D. A. Grimaldi

Herman, L. H.

Jocque, R.


Johnson, K.


Johnson, K.


Liebherr, J. K.


Miclevich, M. F., and S. J. Weller

Miller, J. S.

Nixon, K. C., and Q. D. Wheeler

Pax, S. N., and R. J. Raven

Platnick, N. I.


Platnick, N. I., J. A. Coaddington, R. R. Forster, and C. E. Griswold

Platnick, N. I., and E. Griffin

Pogue, M. G., and M. F. Miclevich

Pothemus, D. A., and J. T. Polhemus

Raven, R. J.


Raven, R. J., and T. B. Churchill

Rindge, F. H.

Rozen, J. G., Jr.


Rozen, J. G., Jr., and S. L. Buchmann
Rozen, J. G., Jr., and R. J. McGinley

Rozen, J. G., Jr., and A. Roig-Alsina

Schaezaller, W. A., Shear, and P. M. Bonamo

Shear, W. A., and J. Kukulovske-Peck

Slater, J. A., and R. T. Schuh

Slipinski, S. A., Q. D. Wheeler, and J. V. McHugh

Stonedahl, G. M.

Stonedahl, G. M., and T. J. Henry

Topoff, H.


Topoff, H., and R. Mendez

Topoff, H., T. Weikert, and E. Zimmerli

Wheeler, Q. D.


Wijesinghe, D. P.* (Sponsor: N. I. Platnick)

Wygodzinsky, P. W., and K. Schmidt

Yeates, D.


Yeates, D., and G. N. Dodson

Abstracts, Reviews, and Popular Publications:

Grimaldi, D. A.


Johnson, K.

Liebherr, J. K.

Yeates, D.


**HERPETOLOGY AND Ichthyology**

Scientific Publications:

Bogert, C. M.


Burnidge, M. E., D. J. Siebert, and C. J. Ferraris, Jr.

Caldwell, J. F., and C. W. Myers

Chiszar, D., H. M. Smith, C. M. Bogert, and J. Vidaurre


### Abstracts, Reviews, and Popular Publications:


Tortoise and freshwater turtle specialist group. Species 15: 64-65.


Comment. First Things 6: 24-25.


Smith, M. L., and R. D. E. McPhee

Stiassny, M. L. J., and P. N. Reinthal

Warkentine, B. E., and J. W. Rachlin

DEPARTMENT OF INVERTEBRATES

Scientific Publications:

Arnold, J. M., H. Mutevi, N. H. Landman, and A. M. Kazaurian

Campbell, K., and L. E. Marcus

Chatterton, B. D. E., G. D. Edgecombe, and P. Tuffnell

Edgecombe, G. D.

Lee, C. Lawrence


Edgecombe, G. D., and B. D. E. Chatterton

Emerson, W. K.

Emerson, W. K., and W. E. Sage, III

Faber, W. W., and J. J. Lee

Feldman, H. R., E. F. Oceen, and F. Hirsch

Harcodina, F. K., and J. J. Lee

Lee, J. J.
1990. Fine structure of the rhodophycean Porphyrudium purpureum in situ in Peneroplis pertusus (Forskal) and P. acicularis (Batsch) and in axenic culture. J. Foram. Res. 20: 162-169.


Lee, J. J., and G. M. Capriulo


Lee, J. J., and C. Lawrence

Lee, J. J., and R. E. Lee

Marcus, L. F.


Patelotski, J., and J. J. Lee

Rachecouf, P. R., and H. R. Feldman

Ramskold, L., and G. D. Edgecombe

Rubin, H. A., and J. J. Lee

Sommer, M., and L. H. Mantel

Voss, R., L. F. Marcus, and P. Escalante

Wheeler, W. C.
1990. When is an outgroup not an outgroup and how to root DNA sequence-based topologies without an outgroup. Cladistics 6: 363-367.


Abstracts, Reviews, and Popular Publications:


Mammalogy:

Scientific Publications:


Musaer, G. G.


Pilbeam, D., M. D. Rose, J. C. Barry, and S. M. Ibrahim Shah

Salazar, B. J., and S. Anderson

Simmons, N. B., M. J. Novacek, and R. J. Baker

Tobach, E.


Tobach, E., and G. J. Casey


Voss, R. S., E. F. Marcus, and P. Escalante P.

**Abstracts, Reviews, and Popular Publications:**

Biknevicius, A. R.

Carleton, M. D., and G. G. Musser

Engelmann, G. F., N. S. Greenwald, G. Callison, and D. J. Chure

Greenwald, N. S.


MacPhee, R. D. E.

Smith, M. L., and R. D. E. MacPhee

**MINERAL SCIENCES**

**Scientific Publications:**

Dai, Y., J. M. Hughes, and P. R. Moore

Fogel, R. A., and M. J. Rutherford

Harlow, G. E., and D. R. Veblen

Ibeada, Y., M. Ethbara, and M. Prinz


Johnson, C. A., and M. Prinz


Mayeda, T. K., R. N. Clayton, Y. Ibeda, and M. Prinz

Peach, C. L., E. A. Mathez, and R. R. Reys

Pohl, D., and D. W. Beatty


Webster, J. D. 1991. Analysis of small samples of trapped and quenched silicate melt by SIMS Fourth East Coast Workshop on Secondary Ion Mass Spectrometry. AT&T Bell Laboratories. p. 28.


Abstracts, Reviews, and Popular Publications:


ORNITHOLOGY

Scientific Publications:


Dickerman, R. W.

The Sealed Antipitta, Galla ria guatimalensis, in Mexico. Southwestern Nat. 35(4): 460-463.


Gnam, R. S., and A. Burchsted* (Sponsor: L. L. Short)

King, B.

King, B., H. Buck, and D. Yong.

Martin, J.-L., and M.-D. Bellot

Mayr, E.

Mayr, E., and P. Ashlock

Mayr, E., and S. J. O'Brien

Short, L. L., and J. F. M. Horne

Stasny F. S., and W. J. Bock

Thibault, J. C., J-L. Martin, and J. Guyot

Veerhoeve, J., and B. King

Voss, R. S., L. F. Marcus, and P. Escalante* (Sponsor: F. Vuilleumier)

Vuilleumier, F.

Abstracts, Reviews, and Popular Publications:

Andors, A. V.

Barrowclough, G. F.

Boek, W. J.


Boek, W. J., and A. V. Andors

Bull, J.

Diamond, J. M.

Escalante, P., P.* (Sponsor: F. Vuilleumier)
Gnam, R. S. (Sponsor: L. L. Short)


Katz, M. (Sponsor: L. L. Short)

Keith, G. S.


King, B.

LeCroy, M., and F. Vuilleumier

Martin, J.L.

Martin, J.L., and A. Clamens

Mayr, E.


Pitocelli, F. J.

Prum, R. O.

Short, L. L.


Short, L. L., and J. F. M. Horne

Vuilleumier, F.


Vuilleumier, F., and A. V. Andors

Vuilleumier, F., and J. Kikkaree

Woodbury, C. J.

**VERTEBRATE PALEONTOLOGY**

**Scientific Publications:**

**Baker, R., M. J. Novacek,** and N. Greenwald

**Charrier, R., A. R. Wyss, M. A. Norell,** J. J. Flynn, M. J. Novacek, M. C. McKenna, C. C. Swisher III, D. Fraschetti, and P. Salinas
MacFadden, B. J., and R. C. Hulbert, Jr.

MacFadden, B. J., C. M. Naeser, P. K. Zeiiler, F. Anaya, H. Perez, and K. E. Campbell, Jr.

MacFadden, B. J., J. D. Bryant, and P. A. Mueller

Maisey, J. G.

Maisey, J. G., and S. Blum

Martincovich Jr., L., E. M. Brouwers, D. M. Hopkins, and M. C. McKenna.

McKenna, M. C.

Norell, M. A.

Norell, M. A., and G. W. Storrs

Norell, M. A., and J. M. Clark

Norell, M. A., and K. de Queiroz

Novacek, M. J., and M. A. Norell

Qiu, Z.-x., and R. H. Tedford

Abstracts, Reviews, and Popular Publications:

Clark, J. M., and M. A. Norell

Dean, D* (Sponsor: E. Delson)

Delson, E.

Delson, E., and D. Dean* (Sponsor: E. Delson)

Eastman, J. T., and L. Grande

Flynn, J. J., and A. Wyss

Flynn, L. J., R. H. Tedford, and Z-x. QuT

Gaffney, E. S.

Gatey, J., and M. A. Norell

Grande, L.

Grande, L., and W. Bemis

Maisey, J. G.

Naylor, G., and J. G. Maisey

Norell, M. A.

Novacek, M. J.


Sereno, P. C., and M. C. McKenna

Tedford, R. H.

LIBRARY SERVICES

Publications:

AMNH Department of Library Services

Rhodes, B.

Root, N.
TREASURER'S REPORT

OPERATING RESULTS

The Museum had a highly successful fund raising year. Gifts increased 32 percent due to the major campaign for increased private support launched in 1990. The heightened private support was an essential offset to the deep reductions in City support and reduced advertising income for Natural History magazine. As a result, revenues remained at the same level as the prior year. Major cost controlling measures were implemented holding expenses to a modest 2 percent increase, a pace slower than the rate of inflation. Nonetheless, the Museum could not completely correct for the reduction in government support and incurred a deficit of $441,060, with total revenues at $48.1 million and total expenses at $48.5 million.

The economic downturn in the region, coupled with the Gulf War, impacted on Natural History magazine, visitor attendance, and the related revenues of the Museum's stores, restaurants, and admissions. An increase in the suggested admission fees offset a lower attendance level. Because the magazine generates much of its advertising revenue from travel-related industries, which also were affected by the Gulf War and the slow economy, in contrast to last year's profit of $530,000, the magazine showed a profit of $433,000.

The Museum moved quickly to compensate for a $630,000 drop in City support. Two halls were closed on alternating days, Museum hours were curtailed, a contractual cleaning service was canceled, and only critical staff vacancies were filled.

The Museum's efforts to increase private support through gifts and special events were successful. Gifts, bequests, and grants rose 32 percent, or $1.6 million over the level reached in 1990. Income from auxiliary activities rose $442,000 over last year's, due primarily to increased income from special events held in the Museum. Toward helping to meet operating costs, the Museum continued to draw 5 percent of a rolling three-year average endowment market value. The distribution from endowment funds increased $1.7 million as a result of the transfer of current funds into endowment and an overall increase in the value of the endowment. The decrease in interest and dividend income was caused by the drop in short-term...
interest rates and the previously noted transfer of current funds into endowment. Other revenue fell $454,000, due to reduced royalties and capital gains that had been generated from the sale of current fund investments in the prior year.

Total expenses for the Museum were $48.5 million, an increase of 2 percent over fiscal 1990. Scientific and educational expenses rose $928,000, or 7 percent, because the Museum expanded certain scientific programs, such as the new molecular systematics laboratory. The drop in exhibition expenses is a reflection of a change in the timetable of expenditures for some exhibitions. Guardianship, maintenance, and operating costs were reduced $209,000, or 2 percent, primarily due to the loss of City funds for guards. In addition, the fiscal 1990 statement reflects a one-time charge of $155,000 for emergency asbestos removal. Administrative costs rose $1.3 million, due primarily to several development of a strategic plan and higher benefit costs not allocated to other areas.

**PLANT FUNDS**

Gifts, bequests, and grants given for capital purposes totaled $3.5 million in fiscal 1991. In May, 1991, the Museum completed a $50 million debt offering, selling bonds for the first time in its history. The net proceeds from the sale of the bonds are being used to help fund major renovations in the fourth floor exhibits of dinosaurs and other fossil vertebrates, collection storage projects, library expansion, and other capital projects.

**ENDOWMENT FUNDS**

Gifts added to the endowment for fiscal 1991 totaled $3.3 million, due primarily to generous bequests from the estates of Henry and Lucy Moses. The market value of the endowment investments totaled $194.9 million at June 30, 1991 (this figure includes $9.6 million in current funds invested with endowment funds).

**TOTAL NET WORTH**

The Museum’s total net worth, as measured by fund balances as of June 30, 1991 (on a cost basis), totaled $200.4 million, versus $193.7 million in the prior year. Total fund balances on market value were $219.4 million, versus the prior year’s $209.9 million, an increase of 4.5 percent.

Charles H. Mott  
Treasurer
# American Museum of Natural History

## Balance Sheets

**June 30, 1991 and 1990**

<table>
<thead>
<tr>
<th>ASSETS:</th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$576,539</td>
<td>$1,380,746</td>
</tr>
<tr>
<td>Receivable for securities sold</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accrued interest and dividends receivable</td>
<td>15,101</td>
<td>74,238</td>
</tr>
<tr>
<td>Accounts receivable, less allowance for doubtful</td>
<td></td>
<td></td>
</tr>
<tr>
<td>accounts of $300,524 and $286,000, respectively</td>
<td>2,371,871</td>
<td>1,790,253</td>
</tr>
<tr>
<td>Investments - Note 2</td>
<td>4,997,632</td>
<td>12,497,154</td>
</tr>
<tr>
<td>Interfund receivable/payable - Note 3</td>
<td>9,032,054</td>
<td>8,100,000</td>
</tr>
<tr>
<td>Merchandise and paper inventories - Note 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planetarium Authority Bonds - Note 5</td>
<td>1,082,095</td>
<td>1,417,706</td>
</tr>
<tr>
<td>Prepaid expenses and other assets</td>
<td>425,000</td>
<td>425,000</td>
</tr>
<tr>
<td>Deferred bond issuance costs, net - Note 6</td>
<td>1,233,186</td>
<td>1,094,837</td>
</tr>
<tr>
<td>Plant &amp; equipment, less accumulated depreciation -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td>$19,733,478</td>
<td>$26,779,934</td>
</tr>
</tbody>
</table>

| LIABILITIES AND FUND BALANCES:                        |            |            |
| Accounts payable and accrued expenses                 | $3,449,581 | $4,625,919 |
| Accrued interest payable                             |            |            |
| Accrued employee benefit costs                        | 3,394,981  | 3,112,286  |
| Payable for securities purchased                     |            |            |
| Unearned membership income                            | 7,843,608  | 7,755,320  |
| Loan from Trust for Cultural Resources - Note 6       |            |            |
| Fund Balances - Note 8                               | 5,045,308  | 11,286,409 |
| **TOTAL LIABILITIES AND FUND BALANCES**               | $19,733,478| $26,779,934|

The accompanying notes are an integral part of these financial statements.
<table>
<thead>
<tr>
<th>PLANT FUND</th>
<th>ENDOWMENT FUNDS</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>$117,802</td>
<td>$104,483</td>
<td>$694,341</td>
</tr>
<tr>
<td>861,654</td>
<td>130,654</td>
<td>861,654</td>
</tr>
<tr>
<td>$223,749</td>
<td>1,067,958</td>
<td>1,306,808</td>
</tr>
<tr>
<td>1,212,983</td>
<td></td>
<td>1,287,221</td>
</tr>
<tr>
<td>$48,752,012</td>
<td>$690,730</td>
<td>2,371,871</td>
</tr>
<tr>
<td>(932,054)</td>
<td>(8,100,000)</td>
<td>1,790,253</td>
</tr>
<tr>
<td>175,856,699</td>
<td>168,616,538</td>
<td>229,606,343</td>
</tr>
<tr>
<td>(8,100,000)</td>
<td>(8,100,000)</td>
<td></td>
</tr>
<tr>
<td>1,082,095</td>
<td>1,417,706</td>
<td></td>
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<tr>
<td>425,000</td>
<td>425,000</td>
<td></td>
</tr>
<tr>
<td>5,946</td>
<td>15,119</td>
<td></td>
</tr>
<tr>
<td>11,250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,248,103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28,925,852</td>
<td>21,818,144</td>
<td>28,925,852</td>
</tr>
<tr>
<td>21,818,144</td>
<td></td>
<td>21,818,144</td>
</tr>
<tr>
<td>$79,223,608</td>
<td>$22,523,993</td>
<td>$169,815,363</td>
</tr>
<tr>
<td>$269,772,449</td>
<td>$211,268,585</td>
<td></td>
</tr>
</tbody>
</table>

| $2,026,883 | $1,427,177 | $512,211 | $136,430 | $5,988,675 | $6,189,526 |
| 11,200     |           |          |          | 850,893    | 551,778   |
|           |           |          |          | 7,843,608  | 7,755,320 |
| 50,000,000 |           |          |          |           | 50,000,000 |
| 26,855,808 | 21,096,816| 168,452,259| 161,276,450| 200,353,375| 193,659,675|
| $79,223,608| $22,523,993| $169,815,363| $161,964,658| $268,772,449| $211,268,585|

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STATEMENTS OF REVENUE, SUPPORT AND EXPENSES
OF OPERATING FUNDS
FOR THE YEARS ENDED JUNE 30, 1991 AND 1990

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>REVENUE AND SUPPORT:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution from Endowment Funds · Note 9</td>
<td>$8,687,000</td>
<td>$7,012,032</td>
</tr>
<tr>
<td>Gifts, bequests and grants</td>
<td>6,371,322</td>
<td>4,818,336</td>
</tr>
<tr>
<td>Appropriation from the City of New York:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds for guardianship and maintenance</td>
<td>6,205,511</td>
<td>6,835,505</td>
</tr>
<tr>
<td>Value of energy services and contribution to pension costs · Notes 10 &amp; 12</td>
<td>2,085,673</td>
<td>1,937,876</td>
</tr>
<tr>
<td>Interest and dividends</td>
<td>693,469</td>
<td>2,647,868</td>
</tr>
<tr>
<td>Visitors' contributions</td>
<td>3,195,596</td>
<td>3,155,269</td>
</tr>
<tr>
<td>Membership</td>
<td>1,602,131</td>
<td>1,532,109</td>
</tr>
<tr>
<td>Natural History magazine</td>
<td>10,421,998</td>
<td>11,267,502</td>
</tr>
<tr>
<td>Auxiliary activities · Note 11</td>
<td>6,288,546</td>
<td>5,846,496</td>
</tr>
<tr>
<td>Other revenue</td>
<td>2,556,829</td>
<td>3,010,869</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE AND SUPPORT</strong></td>
<td>48,108,075</td>
<td>48,063,862</td>
</tr>
</tbody>
</table>

EXPENSES:

Scientific and educational activities         | 14,270,629 | 13,343,078 |
Exhibition                                    | 2,144,682  | 2,391,358  |
Guardianship, maintenance & operating costs · Notes 10 & 12 | 9,695,050  | 9,904,368  |
General & administrative                      | 5,986,156  | 4,734,987  |
Development and public affairs                | 1,949,116  | 1,913,454  |
Natural History magazine                       | 9,989,429  | 10,737,424 |
Membership                                    | 691,609    | 677,358    |
Auxiliary activities · Note 11                 | 3,822,464  | 3,822,358  |
**TOTAL EXPENSES**                            | 48,549,135 | 47,524,385 |

EXCESS OF REVENUE AND SUPPORT OR (EXPENSES)    | ($441,060) | $539,477   |

The accompanying notes are an integral part of these financial statements.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$11,286,409</td>
<td>$21,096,816</td>
<td>$161,276,450</td>
<td>$193,659,675</td>
</tr>
<tr>
<td>3,486,041</td>
<td>3,876,592</td>
<td>3,307,299</td>
<td>6,793,340</td>
</tr>
<tr>
<td>228,841</td>
<td>9,165,446</td>
<td>7,839,923</td>
<td>9,394,287</td>
</tr>
<tr>
<td>2,308</td>
<td>2,798,782</td>
<td>10,102,232</td>
<td>2,801,090</td>
</tr>
<tr>
<td>(441,060)</td>
<td>539,477</td>
<td>(441,060)</td>
<td>539,477</td>
</tr>
<tr>
<td>(441,060)</td>
<td>539,477</td>
<td>3,717,190</td>
<td>15,271,527</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18,142,068</td>
<td>18,547,657</td>
</tr>
<tr>
<td></td>
<td></td>
<td>186,745</td>
<td>1,051,463</td>
</tr>
<tr>
<td></td>
<td></td>
<td>864,718</td>
<td>751,648</td>
</tr>
<tr>
<td></td>
<td></td>
<td>701,2032</td>
<td>8,687,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1,456,000)</td>
<td>7,456,365</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7,456,365)</td>
<td>1,456,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4,344,041)</td>
<td>7,456,365</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2,720,551)</td>
<td>1,456,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10,176,916)</td>
<td>7,456,365</td>
</tr>
<tr>
<td>2,302,239</td>
<td>1,766,263</td>
<td>9,551,718</td>
<td>11,853,957</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>9,551,718</td>
<td>11,853,957</td>
</tr>
<tr>
<td>(5,045,308)</td>
<td>$11,286,409</td>
<td>$168,452,259</td>
<td>$200,353,375</td>
</tr>
<tr>
<td>$26,855,808</td>
<td>$21,096,816</td>
<td>$161,276,450</td>
<td>$193,659,675</td>
</tr>
</tbody>
</table>
1. Summary of Significant Accounting Policies:

Fund Accounting — The accounts of the American Museum of Natural History ("Museum") are maintained in accordance with the principles of fund accounting in order to abide by the limitations and restrictions placed on the use of the resources available to the Museum. Revenue received and expenses incurred for specified purposes are classified for accounting and financial reporting purposes into individual funds for which separate accounts are maintained. However, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. The assets, liabilities and fund balances of the Museum are reported in fund groups as follows:

- Operating Funds, which consist of unrestricted and restricted funds, represent funds available for support of the Museum's operations. Restricted funds are restricted by donors for particular operating purposes such as specific research projects, acquisitions or expeditions.
- Plant Funds represent resources restricted for plant acquisitions and funds expended for plant. Operating funds used for plant acquisitions are accounted for as transfers to the plant fund.
- Endowment Funds include permanent endowment and quasi-endowment funds. Permanent endowment funds are funds subject to the restrictions of gift instruments requiring that the original principal be invested in perpetuity and only the income may be used for unrestricted or restricted purposes. Quasi-endowment funds represent monies transferred to Endowment by the Museum's Board of Trustees, for either unrestricted or restricted purposes.
- Investments — Investments are carried at cost, or if acquired by gift, at fair value at date of acquisition. Purchases and sales of securities are reflected on a trade-date basis. Realized gains and losses on sales of securities are based on average cost. Interest and dividend income on Endowment Funds is distributed to Operating Funds based on a formula adopted by the Board of Trustees as described in Note 9.
- Merchandise & Paper Inventories — Inventories are stated at the lower of cost (first-in, first-out method) or market.
- Plant and Equipment — Plant and equipment are stated at cost, with depreciation calculated on a straight-line basis over the estimated useful lives of the assets. The land and building occupied by the Museum are owned by the City of New York ("City") and are not reflected in the financial statements.
- Collections — In conformity with accounting policies generally followed by museums, the value of collections and other holdings of the Museum is not included in the balance sheets.
- Pledges — Pledges are not reflected in the financial statements until received in cash.
- Membership — Membership income is recognized ratably over the membership term which ranges from one to three years.
2. Investments:

Cost and market values of investments at June 30 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost</td>
<td>Market</td>
</tr>
<tr>
<td>Operating Funds</td>
<td>$4,997,632</td>
<td>$4,997,632</td>
</tr>
<tr>
<td>Plant Fund</td>
<td>48,752,012</td>
<td>48,752,012</td>
</tr>
<tr>
<td>Endowment Funds</td>
<td>175,856,699</td>
<td>194,942,693</td>
</tr>
<tr>
<td>Total Investments</td>
<td>$229,606,343</td>
<td>$248,692,337</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost</td>
<td>Market</td>
</tr>
<tr>
<td>Short term obligations</td>
<td>$61,662,773</td>
<td>$61,662,773</td>
</tr>
<tr>
<td>Fixed income securities</td>
<td>73,522,327</td>
<td>73,577,341</td>
</tr>
<tr>
<td>Common and preferred stocks</td>
<td>90,801,171</td>
<td>110,065,529</td>
</tr>
<tr>
<td>Other investments</td>
<td>3,620,072</td>
<td>3,386,694</td>
</tr>
<tr>
<td>Total Investments</td>
<td>$229,606,343</td>
<td>$248,692,337</td>
</tr>
</tbody>
</table>

The Museum enters into foreign exchange contracts as a hedge against foreign investment transactions. Market value gains and losses on the contracts are deferred and included in the measurement of the related foreign currency investment transactions. At June 30, 1991, the Museum had contracts to sell 11,350,000 French francs (approximately $1,928,000) maturing on August 13, 1991.

The Museum temporarily loans certain endowment fund securities to brokerage firms through its custodian bank. The Museum retains all rights of ownership to the securities loaned and, accordingly, receives all related investment income plus compensation for lending the securities. Under the terms of the lending agreement, the Custodian has agreed to indemnify the Museum against any loss resulting from a borrower's failure to return securities. At June 30, 1991 and 1990, the market values of securities loaned amounted to approximately $6,375,000 and $8,761,000, respectively.

3. Interfund Receivable/Payable:

In May 1990, the Board authorized the transfer of $15,292,966 of operating funds to the Endowment Fund. Of that amount, $7,192,966 was a permanent transfer of specific operating fund balances and is reflected under interfund transfers and $8,100,000, which represents the investment of surplus unrestricted operating funds with the endowment managers, is reflected as a receivable from the Endowment Fund. In addition, other transfers between the Endowment and Operating Funds totalling $263,399 were made during fiscal 1990. In May 1991, an additional $1,456,000 of surplus unrestricted operating funds was transferred to the quasi-endowment as a permanent transfer and is reflected as an interfund transfer.

As of June 30, 1991, the Operating Funds had advanced $932,054 to the Plant Fund for capital expenditures which are reimbursable from bond proceeds. Accordingly, this amount is carried as an interfund receivable by the Operating Funds.

4. Merchandise and Paper Inventories:

Merchandise and paper inventories at June 30 consist of:

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural History  Magazine paper</td>
<td>$481,167</td>
<td>$810,772</td>
</tr>
<tr>
<td>Museum Shop      merchandise</td>
<td>$600,928</td>
<td>$606,934</td>
</tr>
<tr>
<td></td>
<td>$1,082,095</td>
<td>$1,417,706</td>
</tr>
</tbody>
</table>

5. Planetarium Authority Bonds:

The Museum and the American Museum of Natural History Planetarium Authority ("Planetarium") are separate legal entities which share the same Board of Trustees and Officers. The Museum has an investment in bonds of the Planetarium at a cost of $425,000 ($570,000 principal amount), which are past due. For each of the years ended June 30, 1991 and 1990 interest on these bonds (at 4 1/2%) of $25,650 was received and is included in Operating Funds revenue.
6. Loan from Trust for Cultural Resources:

In May 1991, the Museum entered into a loan agreement with the Trust for Cultural Resources of the City of New York ("Trust") primarily to provide long-term financing of the cost of the construction, renovation and equipping of sections of the Museum’s facilities. The Trust issued $25,000,000 of Series 1991 A Revenue Bonds and $25,000,000 of Series 1991 B Revenue Bonds, and loaned the proceeds to the Museum. The entire issued amounts outstanding at June 30, 1991 were as follows:

<table>
<thead>
<tr>
<th>Bond Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series A 5.75% to 6.75%, due serially 1997 to 2008</td>
<td>$7,235,000</td>
</tr>
<tr>
<td>Series A 6.90% Term Bond, due April 1, 2021</td>
<td>17,765,000</td>
</tr>
<tr>
<td>Series B Variable Rate Bonds, due April 1, 2021</td>
<td>25,000,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$50,000,000</strong></td>
</tr>
</tbody>
</table>

The Series A Bonds are dated May 1, 1991 and interest is payable on each April 1 and October 1, commencing October 1, 1991. The term of the Series B Bonds are divided into consecutive Interest Rate Periods selected by the Museum as set forth in the bond resolution. The first Interest Rate Period for all Series B Bonds commenced on the date of issuance of the Series B Bonds (May 23, 1991) and was a Weekly Interest Rate Period. The weighted average interest rate for the variable rate portion of the bonds from May 23, 1991 through June 30, 1991 was 2.75%. The Museum may elect at any time that all of the Series B Bonds will be adjusted to an alternate Interest Rate Period, subject to the satisfaction of certain conditions specified in the bond resolution. At any time, all Series B Bonds bear interest at a Weekly Interest Rate, a Long Term Interest Rate or Bond Interest Term Rates ("BIT") and no Series B Bond shall bear interest in excess of the Maximum Interest Rate as these terms are defined in the bond resolution.

The Series A Bonds are redeemable by the Trust, at the direction of the Museum, at a price of 102 during the period April 1, 2001 to March 31, 2002 and at a price of 101 during the period April 1, 2002 to March 31, 2003. Thereafter, the Series A Bonds are redeemable at par. The Series B Bonds are redeemable by the Trust, at the direction of the Museum, at a price of 100 when the bonds are bearing interest at a Weekly Interest Rate, or a Bond Interest Term Rate and a price ranging from 100 to 102 when the bonds are bearing interest at a Long Term Interest Rate, as these terms are defined in the bond resolution.

While the bonds are not the debt of the Museum, the agreement obligates the Museum to make payments equal to the debt service and sinking fund requirements of the bonds, including any premium on redemption. At June 30, 1991, the Museum’s estimated interest payments under the loan agreement, (with interest on the variable rate portion of the loan estimated at a rate of 5.00%) are $2,616,000 for fiscal year ending June 30, 1992 and $2,937,000 per annum for each of the next four years. The first principal and sinking fund payments are scheduled to occur April 1, 1997.

At June 30, 1991, unexpended loan proceeds, including earnings thereon, totalling $43,649,447 were invested in cash equivalents and were in the custody of a trustee bank. Of this amount, $7,664,203 was held as a reserve for the payment of debt service for the period from date of issue through April 1, 1994, and $35,985,244 was held for construction expenditures.

Payment of the principal and interest on the Series A Bonds and Series B Bonds is insured under certain conditions by separate financial guaranty insurance policies issued by Municipal Bond Investors Assurance Corporation (MBIA). The Museum incurred loan issuance costs of $2,259,757, including $609,000 for insurance. These costs are being amortized over the estimated average maturities of the Series A and B Bonds, which are 21 and 20 years, respectively. Amortization of these issuance costs amounted to $11,654 in fiscal 1991.

Pursuant to the loan agreement and an agreement with MBIA, the Museum is required, among other things, to maintain unrestricted assets, as defined in the bond resolution, having a market value of at least 120% of the Museum’s long-term debt. At June 30, 1991, the Museum had unrestricted assets having a market value of 164% of the Museum’s long term debt.
7. Plant and Equipment:

Plant and Equipment at June 30 consist of:

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibition halls</td>
<td>$13,206,461</td>
<td>$13,110,020</td>
</tr>
<tr>
<td>Leasehold improvements</td>
<td>8,499,426</td>
<td>8,446,567</td>
</tr>
<tr>
<td>Equipment, furniture and fixtures</td>
<td>5,429,260</td>
<td>3,775,249</td>
</tr>
<tr>
<td>Construction-in-progress</td>
<td>12,603,488</td>
<td>5,192,159</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>39,738,635</td>
<td>30,523,995</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>10,812,783</td>
<td>8,705,851</td>
</tr>
<tr>
<td><strong>Net investment in plant &amp; equipment</strong></td>
<td>$28,925,852</td>
<td>$21,818,144</td>
</tr>
</tbody>
</table>

During fiscal 1991, interest income on the invested proceeds of the loan from the Trust amounting to $15,439, net of interest expense of $248,847, has been recorded as a reduction to construction-in-progress costs.

8. Fund Balances:

Included in Plant Fund balances are investments of $48,752,012 and $690,730 in fiscal 1991 and 1990, respectively, which are restricted as to use for capital projects only.

Endowment Fund balances consist of:

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent Endowment Funds, income available for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted purposes</td>
<td>$ 69,168,556</td>
<td>$ 66,421,414</td>
</tr>
<tr>
<td>Unrestricted purposes</td>
<td>20,979,970</td>
<td>21,210,228</td>
</tr>
<tr>
<td>Quasi-endowment (funds functioning as endowment), principal and income available for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restricted purposes</td>
<td>13,246,476</td>
<td>33,414,773</td>
</tr>
<tr>
<td>Unrestricted purposes</td>
<td>65,057,257</td>
<td>40,230,035</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$168,452,259</td>
<td>$161,276,450</td>
</tr>
</tbody>
</table>

As of December 31, 1990, the Museum reclassified a portion of its funds amounting to approximately $18,538,000 which previously had been classified as quasi-endowment, principal and income available for restricted purposes to quasi-endowment, principal and income available for unrestricted purposes because the former category included (i) the principal of and appreciation on certain gifts the terms of which did not require the Museum to maintain such gifts or its appreciation, and (ii) income which when originally earned by the Museum was unrestricted as to its application but which the Museum allocated to such category.

9. Distribution from Endowment Funds:

The policy adopted by the Board of Trustees provides for distributions to unrestricted and restricted funds within the Operating Funds at five percent of the average of the market value of the Endowment Funds for the three preceding years. In 1991, an additional $434,000 was distributed to unrestricted funds to compensate for interest lost on operating funds transferred to the Endowment (see Note 3). The distributions are allocated among funds on a unit basis which reflects the ratio of the related funds invested in the pooled portfolio to the total market value.

The distributions were:

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted Funds</td>
<td>$7,557,700</td>
</tr>
<tr>
<td>Restricted Funds</td>
<td>1,129,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$8,687,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted Funds</td>
<td>$5,952,597</td>
</tr>
<tr>
<td>Restricted Funds</td>
<td>1,059,435</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$7,012,032</td>
</tr>
</tbody>
</table>
10. Guardianship, Maintenance and Operating Costs:

Guardianship, maintenance and operating costs in fiscal 1991 and 1990 include the value of energy services supplied by the City of $1,799,081 and $1,655,500, respectively. In addition, the City appropriates funds for the renovation, improvement and alterations of the buildings occupied by the Museum. These funds are not reflected in the financial statements since they do not flow through the Museum's books. Funds expended by the City for these capital projects in fiscal 1991 and 1990 amounted to $1,669,267 and $2,126,768, respectively.

11. Auxiliary Activities:

Revenue and expenses for auxiliary activities in fiscal 1991 and 1990 were:

<table>
<thead>
<tr>
<th></th>
<th>Revenue</th>
<th>Expenses</th>
<th>Revenue</th>
<th>Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Museum Shop</td>
<td>$2,741,114</td>
<td>$2,152,483</td>
<td>$2,903,957</td>
<td>$2,247,998</td>
</tr>
<tr>
<td>Discovery Tours</td>
<td>954,740</td>
<td>706,562</td>
<td>915,286</td>
<td>612,932</td>
</tr>
<tr>
<td>Naturemax</td>
<td>831,501</td>
<td>459,274</td>
<td>745,605</td>
<td>479,756</td>
</tr>
<tr>
<td>Other</td>
<td>1,761,191</td>
<td>504,145</td>
<td>1,281,648</td>
<td>481,672</td>
</tr>
<tr>
<td>Total</td>
<td>$6,288,546</td>
<td>$3,822,464</td>
<td>$5,846,496</td>
<td>$3,822,358</td>
</tr>
</tbody>
</table>

12. Pension Plan:

The Museum participates in the Cultural Institutions Retirement System Plan ("CIRS Plan"), which consists of an employer funded defined benefit plan and an employee contributory 401K savings plan. It is a multiemployer plan and the actuarial present value of vested and unrestricted accumulated plan benefits and net assets available for plan benefits are not determinable on an individual institution basis. In fiscal 1991, an employer contribution component was added to the 401K savings plan, requiring the Museum to contribute 1% of the salary of active plan participants during the current year. This contribution amounted to $98,041 in fiscal 1991.

The Museum accrues and funds annually the normal cost for eligible employees participating in the CIRS Plan. To be eligible under this plan, employees must be over 21 and employed for a minimum of one year. Total pension costs for eligible employees, including Planetarium personnel, amounted to $1,058,873 and $998,901 in fiscal 1991 and 1990, respectively. Of this amount $286,592 and $282,376 were paid by the City directly to CIRS in fiscal 1991 and 1990, respectively. In fiscal 1990, $286,592 was funded through the Pension Support Endowment Fund. In fiscal 1991, the Board of Trustees reclassified the Pension Support Endowment Fund from restricted quasi-endowment to unrestricted quasi-endowment (see Note 8); accordingly, all current year pension costs, except for the City contribution, were funded by the Operating Funds.

The Planetarium reimburses the Museum for actual payroll costs for its staff. It also reimburses the Museum for all employee benefit costs, including pension, which are calculated as a percentage of payroll and amounted to $171,908 and $168,429 in fiscal 1991 and 1990, respectively.

13. Postretirement Benefits:

The Museum provides health insurance for all retired employees and life insurance for certain retired employees. Postretirement benefit costs are presently expensed when paid and totalled $560,397 and $527,483 in fiscal 1991 and 1990, respectively.

The Museum has not yet determined the potential impact of Statement of Financial Accounting Standards No. 106 “Employers’ Accounting for Postretirement Benefits Other Than Pensions”. This pronouncement, which is required to be adopted for the fiscal year ending June 30, 1994, will require a change in accounting to the accrual method for postretirement benefit costs. The impact of adopting this statement cannot be estimated until a determination is made as to the year and method of adoption.

14. Related Party Transactions:

The Museum provides certain services to the Planetarium, such as insurance, accounting and maintenance, for which the Planetarium was charged an aggregate amount of $201,050 and $194,708 in fiscal 1991 and 1990, respectively. The Museum also received approximately $46,195 and $55,700 in fiscal 1991 and 1990, respectively, for visitors who entered the Museum from the Planetarium.
15. Tax Status:
The Museum is a not-for-profit organization exempt from corporate federal income tax under Section 501(c)(3) of the Internal Revenue Code.

16. Reclassifications:
Certain amounts in fiscal 1990’s statements have been reclassified to conform to fiscal 1991’s presentation.

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Board of Trustees of the American Museum of Natural History:

We have audited the accompanying balance sheets of the AMERICAN MUSEUM OF NATURAL HISTORY as of June 30, 1991 and 1990, and the related statements of revenue, support and expenses of operating funds and statements of changes in fund balances for the years then ended. These financial statements are the responsibility of the Museum's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the American Museum of Natural History at June 30, 1991 and 1990, and the results of its operations and changes in its fund balances for the years then ended, in conformity with generally accepted accounting principles.

Coopers & Lybrand
New York, New York
October 7, 1991
## BALANCE SHEETS -
### JUNE 30, 1991 AND 1990

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$67,673</td>
<td>$299,374</td>
</tr>
<tr>
<td>Investments - Note 2</td>
<td>2,054,736</td>
<td>1,657,266</td>
</tr>
<tr>
<td>Receivables and other assets</td>
<td>7,725</td>
<td>34,456</td>
</tr>
<tr>
<td>Planetarium shop inventory</td>
<td>43,638</td>
<td>55,739</td>
</tr>
<tr>
<td>Plant and equipment - Note 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building, at cost</td>
<td>1,019,210</td>
<td>1,019,210</td>
</tr>
<tr>
<td>Building improvements, at cost</td>
<td>1,522,400</td>
<td>1,397,798</td>
</tr>
<tr>
<td>Zeiss Planetarium instruments, at cost</td>
<td>221,928</td>
<td>221,928</td>
</tr>
<tr>
<td></td>
<td>2,763,538</td>
<td>2,638,936</td>
</tr>
<tr>
<td>Less: Accumulated depreciation</td>
<td>(2,002,831)</td>
<td>(1,896,931)</td>
</tr>
<tr>
<td>Net plant and equipment</td>
<td>760,707</td>
<td>742,005</td>
</tr>
<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td>$2,934,479</td>
<td>$2,788,840</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LIABILITIES, CONTRIBUTED CAPITAL AND FUND BALANCES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and accrued expenses</td>
<td>$181,288</td>
<td>$103,722</td>
</tr>
<tr>
<td>Accrued employee benefit costs</td>
<td>135,800</td>
<td>115,050</td>
</tr>
<tr>
<td>4% Refunding Serial Revenue Bonds, past due - Note 3</td>
<td>570,000</td>
<td>570,000</td>
</tr>
<tr>
<td>Accrued interest past due</td>
<td>315,450</td>
<td>315,450</td>
</tr>
<tr>
<td></td>
<td>1,202,538</td>
<td>1,104,222</td>
</tr>
<tr>
<td>Contributed capital:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charles Hayden</td>
<td>156,869</td>
<td>156,869</td>
</tr>
<tr>
<td>Charles Hayden Foundation</td>
<td>429,455</td>
<td>429,455</td>
</tr>
<tr>
<td>The Perkin Fund</td>
<td>400,000</td>
<td>400,000</td>
</tr>
<tr>
<td></td>
<td>986,324</td>
<td>986,324</td>
</tr>
<tr>
<td>Fund Balances - Note 4</td>
<td>745,617</td>
<td>698,294</td>
</tr>
<tr>
<td><strong>TOTAL LIABILITIES, CONTRIBUTED CAPITAL AND FUND BALANCES</strong></td>
<td>$2,934,479</td>
<td>$2,788,840</td>
</tr>
</tbody>
</table>

The accompanying notes are an integral part of these financial statements.
## Statements of Activity and Fund Balances
**For the Years Ended June 30, 1991 and 1990**

<table>
<thead>
<tr>
<th></th>
<th>1991</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REVENUE:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission fees, net</td>
<td>$1,175,103</td>
<td>$1,288,152</td>
</tr>
<tr>
<td>Planetarium shop sales</td>
<td>226,235</td>
<td>278,671</td>
</tr>
<tr>
<td>Special lectures and courses</td>
<td>63,124</td>
<td>60,791</td>
</tr>
<tr>
<td>Gifts, bequests and grants</td>
<td>102,728</td>
<td>76,000</td>
</tr>
<tr>
<td>Income from investments</td>
<td>142,271</td>
<td>152,299</td>
</tr>
<tr>
<td>Other revenue, net</td>
<td>147,190</td>
<td>71,496</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE</strong></td>
<td><strong>1,856,651</strong></td>
<td><strong>1,927,409</strong></td>
</tr>
<tr>
<td><strong>EXPENSES:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparation, presentation and promotion</td>
<td>707,856</td>
<td>655,116</td>
</tr>
<tr>
<td>Operation and maintenance</td>
<td>361,622</td>
<td>360,435</td>
</tr>
<tr>
<td>General and administrative</td>
<td>187,169</td>
<td>221,935</td>
</tr>
<tr>
<td>Planetarium shop expenses</td>
<td>196,508</td>
<td>231,426</td>
</tr>
<tr>
<td>Special lectures and courses</td>
<td>41,472</td>
<td>44,976</td>
</tr>
<tr>
<td>Special purpose programs and projects</td>
<td>5,633</td>
<td>32,075</td>
</tr>
<tr>
<td>Laser program expenses</td>
<td>177,518</td>
<td>185,179</td>
</tr>
<tr>
<td>Interest on past due 4 1/2% Refunding Serial Revenue Bonds</td>
<td>25,650</td>
<td>25,650</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES BEFORE DEPRECIATION</strong></td>
<td><strong>1,703,428</strong></td>
<td><strong>1,756,792</strong></td>
</tr>
<tr>
<td><strong>EXCESS OF REVENUE OVER EXPENSES BEFORE DEPRECIATION</strong></td>
<td><strong>153,223</strong></td>
<td><strong>170,617</strong></td>
</tr>
<tr>
<td>Depreciation expense</td>
<td>105,900</td>
<td>86,161</td>
</tr>
<tr>
<td><strong>EXCESS OF REVENUE OVER EXPENSES</strong></td>
<td><strong>47,323</strong></td>
<td><strong>84,456</strong></td>
</tr>
<tr>
<td>Balances, beginning of year, as previously reported</td>
<td>1,717,504</td>
<td>1,633,048</td>
</tr>
<tr>
<td>Adjustment for the cumulative effect of depreciating the building</td>
<td>(1,019,210)</td>
<td>(1,019,210)</td>
</tr>
<tr>
<td>Balances, beginning of year as adjusted</td>
<td>698,294</td>
<td>613,838</td>
</tr>
<tr>
<td><strong>BALANCES, END OF YEAR</strong></td>
<td><strong>$ 745,617</strong></td>
<td><strong>$ 698,294</strong></td>
</tr>
</tbody>
</table>

The accompanying notes are an integral part of these financial statements.
1. Summary of Significant Accounting Policies:

Fund Accounting — The accounts of the American Museum of Natural History Planetarium Authority ("Planetarium") are maintained in accordance with the principles of fund accounting in order to abide by the limitations and restrictions placed on the use of the resources available to the Planetarium. Revenue received and expenses incurred for specified purposes are classified for accounting and financial reporting purposes into individual funds for which separate accounts are maintained. However, for reporting purposes in the accompanying financial statements, all funds have been combined.

Plant and Equipment - Change in Accounting Policy — The land utilized by the Planetarium was donated by the City of New York ("City"). In the event the Planetarium discharges all its liabilities, including bonds, the real property reverts to the City. Because of this provision, the Planetarium did not depreciate the building in prior years. During the year ended June 30, 1991, the Planetarium adopted the policy of depreciating its building in conformity with the Statement of Financial Accounting Standards No. 93 which requires the recording of depreciation on long-lived tangible assets for all not-for-profit enterprises. The financial statements for the year ended June 30, 1990 have been restated to apply the new method retroactively. The effect of the change was to record accumulated depreciation of $1,019,210 as the economic useful life of the building has now expired. Major building improvements and equipment purchases are capitalized and depreciated by the straight-line method over their useful lives.

Investments — Investments are stated at cost, or if acquired by gift, at fair value at date of acquisition.

Inventories — Inventories are stated at the lower of cost (first-in, first-out method) or market.

2. Investments:

Investments at June 30, 1991 consist of short-term obligations in the amount of $1,550,000 and fixed income securities in the amount of $504,736. The aggregate market value approximates cost.

3. Revenue Bonds:

The Planetarium’s 4½% Refunding Serial Revenue Bonds are owned by the American Museum of Natural History ("Museum"). The Charles Hayden Foundation contributed $200,000 to the Museum toward the purchase of such bonds.

4. Fund Balances:

Included in fund balances are approximately $131,000 and $137,000 in fiscal 1991 and 1990, respectively, restricted by donors for specific purposes.

5. Related Party Transactions:

The Planetarium and the Museum are separate legal entities which share the same Board of Trustees and Officers.

The Museum provides certain services, such as insurance, accounting and maintenance, to the Planetarium. The aggregate charges for these services in fiscal 1991 and 1990 were $201,050 and $194,708, respectively.
The Planetarium reimburses the Museum for actual payroll costs for its staff. It also reimburses the Museum for all employee benefit costs, including pension, which are calculated as a percentage of payroll and amounted to $171,908 and $168,429 in fiscal 1991 and 1990, respectively. The Planetarium also paid the Museum approximately $46,195 and $55,700 in fiscal 1991 and 1990, respectively, for visitors who entered the Museum from the Planetarium.

6. Tax Status:
The Planetarium is a not-for-profit organization exempt from corporate federal income tax under Section 501(C)(3) of the Internal Revenue Code.

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**REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS**

To the Board of Trustees of the American Museum of Natural History Planetarium Authority:

We have audited the accompanying balance sheets of the AMERICAN MUSEUM OF NATURAL HISTORY PLANETARIUM AUTHORITY as of June 30, 1991 and 1990, and the related statements of activity and fund balances for the year then ended. These financial statements are the responsibility of the Planetarium's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the American Museum of Natural History Planetarium Authority at June 30, 1991 and 1990, and the results of its operations and changes in its fund balances for the years then ended, in conformity with generally accepted accounting principles.

As discussed in Note 1 to the financial statements, in 1991 the Planetarium adopted the policy of depreciating its building which previously had been capitalized but not depreciated. Amounts in the 1990 financial statements have been restated to conform to the 1991 presentation.

Coopers & Lybrand

New York, New York
October 7, 1991
COMMITTEES OF THE BOARD OF TRUSTEES* (as of June 30, 1991)

AUDIT COMMITTEE
Donald C. Platten, Chairman*
Frank G. Lyon
Plato Malozemoff
Charles H. Mott
Lawrence G. Rawl

BUDGET AND FINANCE COMMITTEE
Nancy Fessenden, Chairman
Howard L. Clark
Caroline Macomber
Plato Malozemoff
Frank A. Metz, Jr.
Charles H. Mott

BUILDING AND GROUNDS COMMITTEE
Frank Y. Larkin, Chairman
Daniel Brodsky
L. F. Boker Doyle
Henry Clay Frick, II
Frank G. Lyon
Caroline Macomber
Julia Serena di Lapioggio
Alfred R. Stern

EDUCATION AND EXHIBITION POLICY COMMITTEE
Caroline Macomber, Chairman
Lewis W. Bernard
Melinda Blinken
Daniel Brodsky
Samuel C. Butler
Nancy Fessenden
John N. Irwin, II
Helene L. Kaplan
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COVER: Three photographs highlight the scope of the American Museum of Natural History’s collections, which total some 30 million artifacts and specimens. The collections form the basis of the Museum’s research, exhibition and education programs. The beautiful 19th-century illustration (left) by Nicholas Pike, of the sea bass *Serranus oceanicus*, appears in the manuscript “The Fishes of Mauritus,” one of 10,000 volumes in the rare book collection. The Tsimshian ceremonial mask (center) is from the outstanding Northwest Coast Indian collection, considered by experts to be the most important in the world. The mask is one of the Department of Anthropology’s 660,000 artifacts. A superb specimen of beryl (aquamarine) in a matrix of white albite (right), found in Dusso, Pakistan, is on view in the Harry Frank Guggenheim Hall of Minerals. It is one of 125,000 rocks, minerals, gems and meteorites maintained by the Department of Mineral Sciences.