

AMERICAN
MUSEUM OF
NATURAL
HISTORY

110th
ANNUAL REPORT
1978/79



**110TH ANNUAL REPORT
JULY 1978 THROUGH JUNE 1979**

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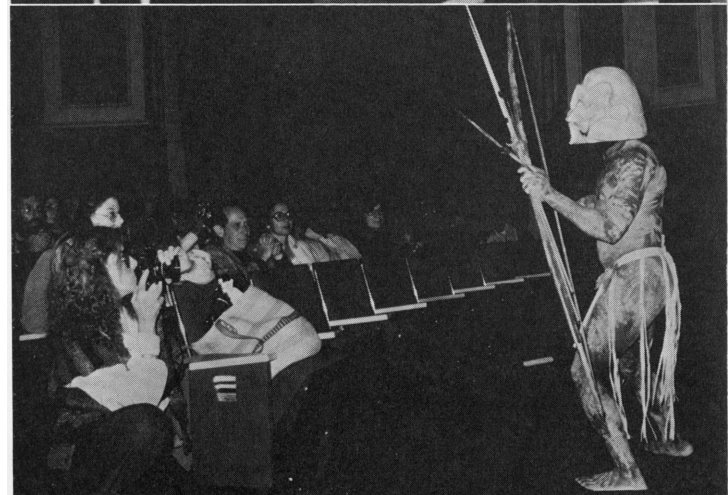
Who is the Museum?

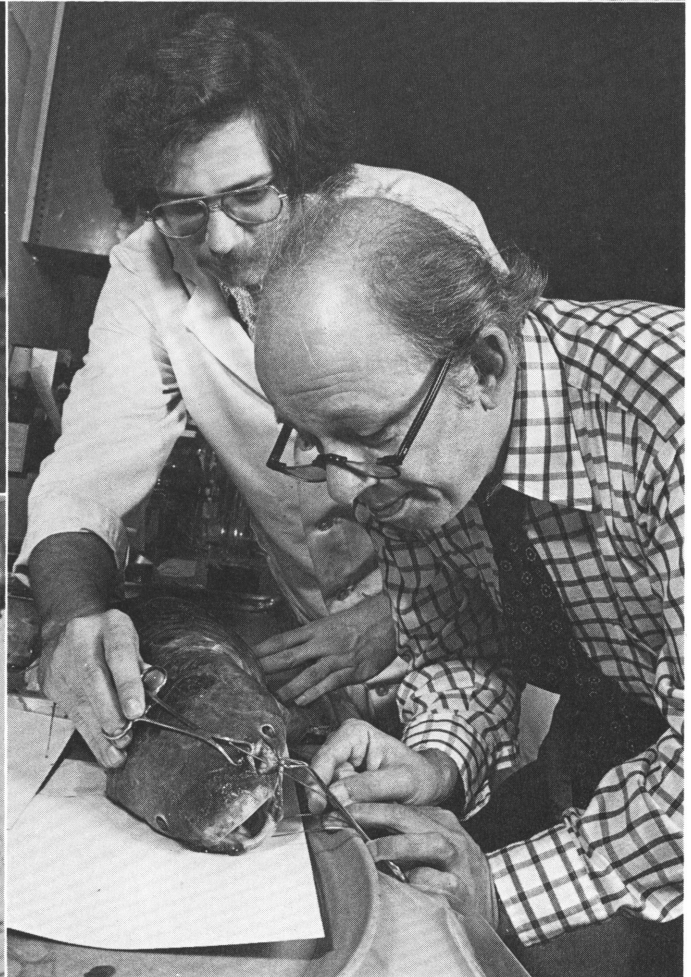
The American Museum of Natural History is people. They work together to conduct the Museum's three major programs: scientific research, exhibition and education. It is a mission that never ends.

These programs enrich both the scientific and general communities because of the untiring efforts of dedicated people; Trustees, staff and volunteers; and thanks to the interest and contributions of our visitors, members, donors and many other individuals. Support also comes from corporations, foundations and from various levels of government.

Each year, we welcome 2,500,000 visitors to our 38 exhibition halls, the Hayden Planetarium, Museum classes and tours, and special exhibitions such as POMPEII AD79 and Volcano!

The energies and talents of many people make this a living institution. Without all of these groups and individuals, it would not work the way it does.





One hundred and tenth Annual Report of the President

To the Trustees of the American Museum of Natural History and to the Municipal Authorities of the City of New York.

The American Museum of Natural History is widely recognized today as a living, growing, and changing organism pursuing a very active role in public education and research. This recognition has resulted from a variety of factors: changed exhibition policies, physical improvements made to public spaces, and a number of educational programs.

In the past, museums such as ours had tended to be seen as static, unchanging and dusty repositories of collections and displays of inanimate objects. This certainly is no longer the case.

Special exhibitions, such as last year's "Ice Age Art" and this year's POMPEII AD79 and Volcano! have had a spectacular success in drawing new audiences to the Museum. We are grateful to the Xerox Corporation and the National Endowment for the Humanities for their generous support. The favor-

"(our able and dedicated staff members) are the mainspring of this institution, and in the past year a continuing effort has been made to improve the conditions under which they work."

able publicity which these exhibitions have received as well as the added excitement and interest which they have generated has increased attendance materially. Our newest special exhibition, "Gold of El Dorado: The Heritage of Colombia," promises to continue this healthy trend. Our continuing Exhibit of the Month program and other temporary exhibits dealing with a wide variety of subjects have also been well received.

A carefully-planned program for the physical improvement of the areas open to the public, some of them constructed more than one hundred years ago, has made them competitive with those of more modern museums without losing their inherent charm. The installation of acoustical ceilings, new lighting, carpeting, air conditioning and modern signs has greatly improved the quality of the service we provide to our visitors. The Hall of Ocean Life, pictured on the back cover, is a case in point. With grants from several private foundations, it has been made much more attractive and functional, filling a long-standing need for a large public reception space.

The Museum's exhibits, particularly the dioramas for which it is justly famous, are being restored to their original condition. It is amazing to see the change produced by cleaning the background paint-

ings, the animals and vegetation, and by relamping with modern, improved lighting fixtures! The Akeley Hall of African Mammals has now been substantially redone and we have assurance of further funds which may complete the job. While we still have a long way to go in the Museum as a whole, the change is already noticeable.

Substantial numbers of our visitors have availed themselves of our Highlight and History tours given by our specially trained volunteers. These personally-guided visits have added an extra dimension to our dioramas, in particular. Recorded audio tours of special exhibits have also contributed to visitor enjoyment. The Margaret Mead Film Festivals have also drawn crowds and, of course, our adult education courses continue to be most popular.

While the public side of the Museum which occupies over 600,000 square feet of space is highly visible, an equally important part is less well-known except in scientific circles. This is the part devoted to research, collection storage and laboratories. A later part of this report tells in some detail of the research done by our able and dedicated staff. They are the mainspring of this institution, and in the past year a continuing effort has been made to improve the conditions under which they work. Offices, storage space, laboratories, and halls have been painted, relighted and otherwise improved.

The well-attended symposium on vicariance biogeography, discussed elsewhere in this report, is an example of the scientific leadership offered by the Museum.

A major effort to improve the condition of collections has been under way for some time. This year and for several years to come, the emphasis will be in the area of anthropology. The Margaret Mead Fund for Anthropology has generated grants from several foundations, enabling us to get a good start on recataloging, cleaning, restoring, and arranging for the permanent housing of our ethnographic material under climate-controlled conditions. One by-product, incidentally, has made possible special exhibits, such as "Objects of Bright Pride," featuring Northwest Coast Indian artifacts. It is presently being circulated to museums around the country, as is "Ice Age Art."

The death last fall of Margaret Mead leaves a void in our ranks. Dr. Mead was an institution in her own right, a pioneer in her own particular field of anthropology, who provided a bridge between the science with which she so closely identified and the young. Her efforts to broaden our understanding of other cultures will be carried on through the fund established to honor her and her achievements.

Certainly it will come as no surprise to anyone who has tried to balance a checkbook recently that the Museum has felt the impact of inflation, of a depressed stock market, and economic downturns.



Two of the exquisite pieces from the "Gold of El Dorado" exhibition.

One has to face the increasing costs associated with operating the institution, but we have been fortunate in our efforts to generate additional support from the governmental sector, corporations, foundations, and individuals. Also, the steady flow of visitors and the contributions they make have become increasingly important for us in meeting our budget.

Our Corporate Fund Campaign is an effort to stimulate even greater involvement by business in the Museum. The response of the business community has been particularly encouraging.

I am pleased to welcome a new Trustee, Samuel C. Johnson. After many years of dedicated service, Thomas J. Watson, Jr., submitted his resignation from the Board upon accepting an appointment to a governmental position. He was elected an Honorary Trustee.

We were saddened by the death on November 14 of W. Douglas Burden, for more than 50 years a Trustee and Honorary Trustee.

In the coming year I trust that our degree of success will increase: that we will reach more people with our exhibits, special exhibitions and educational programs; that those who are already committed will take a greater interest and get involved in even more of our programs. Our doors are open and everyone is welcome.

Robert G. Goelet

Robert G. Goelet, *President*

Director's Message

The American Museum of Natural History is a dynamic, active place, where innovation, imagination, change and even controversy are the rule rather than the exception. It has been thus in my twenty-five years of association with it, including the past ten as director.

I became director in 1969, our Centennial, and what a dramatic, bustling year it was! During that Centennial celebration, the Museum was visited by nearly four million persons; it served as host for a dozen convocations and meetings of scientific and scholarly societies, and it startled the museum world with its dramatically different exhibition on what was then a startling theme: "Can Man Survive?" The Museum completed and presented an amazing number of great, permanent exhibition halls, including Gold of the Americas, Mexico and Central America, Man in Africa, Earth History, Peoples of the Pacific, Ocean Life and Biology of Fishes.

With that blaze of glory to usher in its second century, it might have seemed that the Museum deserved a rest, that little could remain to be done. On the contrary: the first decade of our second hundred years has been filled with challenge and opportunity—busy, developing years in which we continued to build a future worthy of the Museum's traditions and its potentials. To simply recount all that has happened in these past ten years would not be constructive. That is documented in past volumes of our Annual Report. It is more important, I think, to consider why things happened, as the best clue to where we may be going in the future.

One of the most important factors behind the direction I have tried to give the Museum is my conviction that it should be a great educational institution, as its founders intended. But I am just as strongly convinced that this is not possible unless we are also a great scholarly institution. In our past, the pendulum has swung between our educational service and our scientific strength, often reflecting forces and pressures outside the Museum. From its founding, however, the Museum has been committed to both, and to exhibitions as a major element in its teaching role.

I have always resisted the notion that one or the other, education or research, is our *most* important function, and refuse to classify either one as such. Instead, I recognize both as inherent functions that derive from our greatest resource—our collections. That, it seems to me, is the one thing that sets a museum apart from all other kinds of institutions. Without collections, it will slowly drift into something else, a school or a college, or a research institute, or a display center or an amusement house.

Responsibility for building and maintaining collections gives a museum a uniqueness among all other human institutions, if carried out with purpose. The purpose must be more than mere storage;

otherwise the institution is only a warehouse. A building full of specimens isn't necessarily a museum anymore than a building full of books is necessarily a library. The books become a library when they are used to disseminate knowledge. The collections become a museum when their purpose is to *acquire* and *disseminate* knowledge. The collections are there to study, in order to derive from them the knowledge we can learn about the universe they represent, and to teach, in order to share that knowledge with society.

No scholarly institution, in my opinion, can really teach with authority unless at the same time it holds

"We have not nearly begun to run out of ideas on how to make this great institution still greater, more effective, more useful, more productive."

a position of authority in the acquisition of knowledge. To stand in the forefront as a great teacher and exhibitor of science, the American Museum must also be in the forefront of scientific research in relevant fields. For this reason, I have pursued a policy as director of seeking to strengthen the quality, independence, responsibility and participation of our scholarly staff (our curators and their associates) and their resources.

This motivation is reflected in a series of policy statements formulated jointly by the administration, the staff, and the trustees early in my tenure as director. One, a statement of science policy, enunciated the rationale and the strategy for our research objectives; another expressed the policies that govern the employment and responsibilities of scientific and educational personnel; a third clarified our responsibilities with respect to collection management. But policy is somewhat barren without practice. We have broadened the representation of curators in counselling the administration, strengthened the curatorial role in departmental and collection management, encouraged stronger administration in the scientific departments.

We also have allocated substantial new resources to collection management and related curatorial facilities. In my first year as director, a professionally directed space study identified an immediate need for half a million square feet of additional floor space, principally to provide adequately for collections and related curatorial responsibilities. While I recognized that eventually additional buildings must be constructed (the original plan for the Museum is only about 60 percent accomplished), I was convinced that solutions to many of our problems could be found within the existing complex of buildings, given imaginative planning and modest funding for

renovation and equipment. I believe that this conviction has been amply verified. We have constructed only one new building for curatorial purposes in the past ten years, the Childs Frick Memorial Building, a magnificent new addition for the management of our fossil mammal collection and for the Department of Vertebrate Paleontology staff. But we have very nearly doubled the effective space allocated to the departments with the largest collections and the greatest need for additional curatorial spaces: Entomology, Invertebrates and Anthropology. And we have substantially increased the spaces allocated to Mammalogy, Mineral Sciences, Ichthyology, Animal Behavior, and Vertebrate Paleontology (for the fossil fish and fossil reptile collections). We have also built and equipped an effective interdepartmental laboratory facility and a modern mineral science laboratory; substantially improved the facilities, services and resources of our research library; improved and expanded the collection storage equipment in virtually every department; and renovated most of our curatorial offices and laboratories. As one small example, ten years ago, not ten percent of our curators' offices and laboratories were air conditioned, properly

lighted, and protected with automatic fire detectors. Today all are.

The record is equally impressive in the growth of educational facilities, including exhibitions. We have continued to plan and build new, permanent exhibitions: Mollusks and Mankind, the Morgan Hall of Gems, the Guggenheim Hall of Minerals, Reptiles and Amphibians, the soon-to-be-opened Gardner D. Stout Hall of Asian Peoples, the re-installed Margaret Mead Hall of Pacific Peoples, and the new Arthur Ross Hall of Meteorites. Major renovations have vastly improved the effectiveness of the Auditorium, Education Hall, and the Hall of Ocean Life and the Biology of Fishes. And we have provided for an entirely new dimension in our public exhibition program by the construction of Gallery 77 and Gallery 3, two halls specially equipped for changing, special exhibitions, allowing us to present such outstanding special shows as "Costumes of the East," "Shadow Puppets," "Peru's Golden Treasures," "Ice Age Art," POMPEII AD79, and the forthcoming "Gold of El Dorado: the Heritage of Colombia," all featuring exquisite collections and effective teaching objectives. Five new, innovative teaching facilities have also been added to the resources of

President Goelet, left, presents Dr. Nicholson with Honorary Life Member certificate, honoring his 25 years with the Museum.



the Education Department: the Alexander M. White Natural Science Center, the People Center, Education Gallery, the Discovery Room and the newly-renovated Calder Laboratory. And again on that small point of air conditioning, none of the above was air conditioned ten years ago. All are today.

One of the most important elements in the growth and strengthening of our exhibition program has been the solution to its financial stability, long a

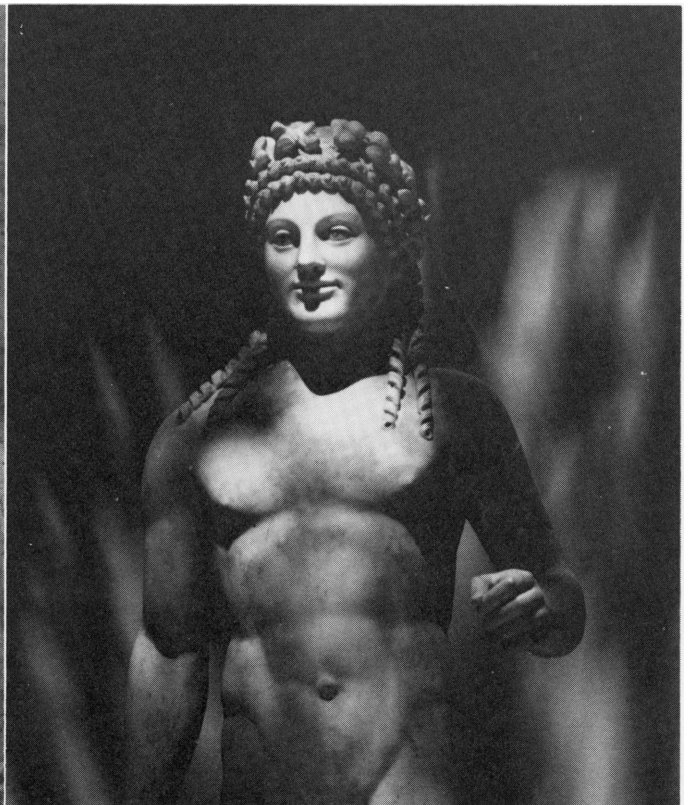
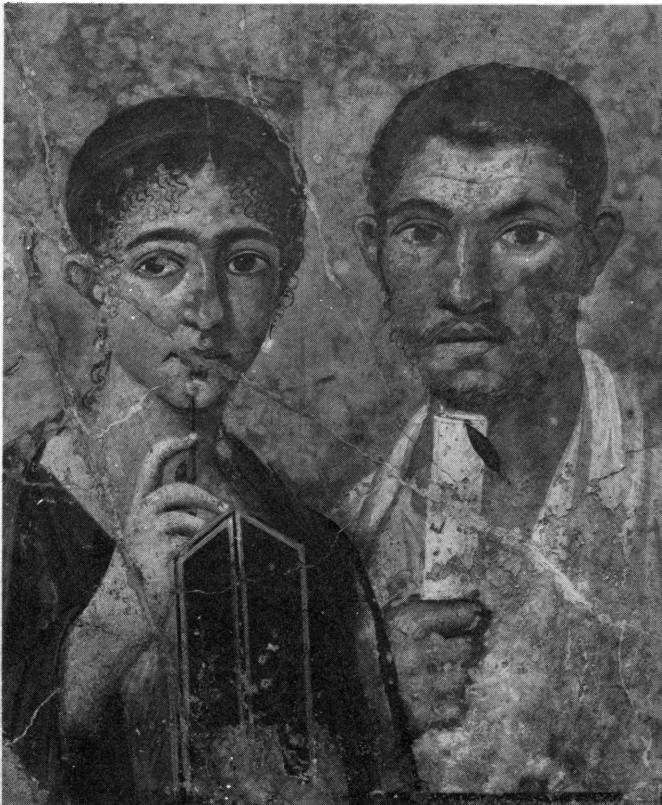
“No scholarly institution, in my opinion, can really teach with authority unless at the same time it holds a position of authority in the acquisition of knowledge.”

vexing problem. It had been the practice to finance new exhibits out of capital reserves, reducing investment income, which is essential as part of our base of financial support. The introduction of our discretionary admission fee program (pay what you wish, but you must pay something) in 1971 and the allocation of admission income to exhibition support resolved the problem. The use of this source of

visitor-related income illustrates another principle that has guided much of the direction I have given to the Museum. My early Museum employment was in the Hayden Planetarium, where all of our income was visitor-related, all earned for services. I saw two very important advantages in the dependence on “earned” income: we were deeply concerned for the quality of the services we offered and their acceptance by our visitors; and such income, properly managed, could adjust for the effects of inflation, increasing at or even greater than the inflation of the economy.

The applications of that principle have encouraged us to seek growth in our membership and membership-related income. Total membership has increased three-fold in the past ten years; membership support has increased ten-fold; and we are finally embarked on a program of higher class membership that promises additional direct and indirect support. We invested a modest sum in Museum Shop improvements, and it has returned handsome dividends in popularity, visitor service and financial support, which increased more than five-fold in ten years. Similar growth can be seen in other visitor-dependent sources of income, and I

This fresco and sculpture were part of the Pompeii show.



daresay that we are irrevocably embarked in a direction that will make the Museum and its employees continually more visitor conscious, more aware of the quality and the effectiveness of its services for the consumer who uses them.

These past ten years have been truly exciting and rewarding, but they have certainly not been without their problems. The threat posed by New York City's financial crisis of 1974-75 was horrendous, for example; and we are continually tilting with that old dragon, inflation. But the problems have been more than matched by solid accomplishment in so many areas, including Museum administration: the introduction of our new and vastly more satisfactory retirement plan; development of stable and satisfactory relationships with the unions representing our employees; gradual extension of flexible working hours to our employees; productivity improvements that have more than matched the increases in labor costs; and introduction of major economies in our energy consumption despite substantial growth in energy needs and unit costs.

The heart of the process to me is intelligent, imaginative, realistic optimism—the conviction that we have not nearly begun to run out of ideas on how to make this great institution still greater, more effective, more useful, more productive. Museum work may seem frustrating at times, but it is never boring. It is the most exciting, challenging, rewarding and enjoyable work I can imagine.



Thomas D. Nicholson, *Director*

Science and Education Departments

The essence of this Museum can be boiled down to four main programs, with all other activities supporting these. The programs are: exhibition, education, research and collections management.

Last year's successful POMPEII AD79 and Volcano! exhibitions illustrate the growing trend among natural history museums to attract a wider group of people. The purpose is to broaden the audience and enhance the Museum's image by gaining recognition for its cultural contributions as well as the purely scientific goals. The other part of the reason for this trend is economic; as costs go up, the support of a wider constituency is needed.

The Museum is proud of its educational programs, which are probably more extensive than those of any other natural history museum in North America, and perhaps the world. Every level—from pre-schoolers to postdoctoral scholars—is served. The diversity of the educational and cultural programs reflect our recognition of the ethnic and cultural diversity of New York, and our commitment to be a vital part of our immediate community. Educational programs also build a bridge between science and arts and the humanities through such offerings as tours, workshops, dance exhibitions and motion picture series.

Research is essential. For example, anthropological research, such as the Museum explorations of North American Indian sites at St. Catherines Island, Georgia, first settled 4000 years ago, presents clues about the development of society. Mineral sciences research is of tremendous fundamental importance to mankind. Detailed analytical investigations of meteorites, moon rocks, and earth minerals, for example, help unlock the secrets of how the universe was formed and the evolution of the solar system. On a different level, investigations of the interaction between minerals and medicine, such as a pending study by the Department of Mineral Sciences of fibrous minerals including asbestos, help amass needed data for the fight against disease.

Most Museum departments deal with zoology. Research into the diversity of animal life on the planet provides tools for dealing with the environment. One area of intense interest is biogeography—the distribution of animals and plants. The Museum took a leadership role in this field by organizing an international symposium in May, 1979, "Vicariance Biogeography: a Critique." Some 350 zoologists, botanists, geologists, geographers and other scientists participated. Biogeography and the method developed by Leon Croizat in this field were discussed in detail during the three-day session. Donn E. Rosen, Curator, Department of Ichthyology,

organized the conference with cooperation from other Museum departments. The proceedings will be published by Columbia University Press. Gareth J. Nelson, Curator, Ichthyology, serves as general editor.

Collections are the fountainhead of the Museum's existence. Huge collections of everything from minerals to animal specimens to human artifacts determine the direction of Museum exhibits, educational programs and research. Fewer than 10 percent of the collections go on public display. Most are used by scientists and scholars for basic research to expand scientific knowledge.

The Museum staff is working hard to vastly improve the storage, accessibility, and long-term preservation of our collections. The effort put into this over past years, such as the newly completed mineral sciences collection area and the work on preserving priceless anthropology artifacts, is part of the Museum's commitment to future generations.

Department of Animal Behavior

The goal of the department is to understand the development and evolution of behavior, as well as the special role of behavior in the adaptation of different species. Its research compares a wide variety of animal species ranging from army ants and lizards in Arizona, to sea hares in the waters off Brittany, France, to electric fish in Lake Kainji, Nigeria, and birds and cockroaches in New York.

The living animals studied are correlates of specimens in the collections of both extinct and contemporary species at the Museum. In itself, behavior is not a material artifact or an object. But an animal does leave its behavioral imprint on the contemporary environment in which it lives, and in the structures and physiology of its descendants by evolutionary processes. Hence, the comparative study of the behavior of living species helps explain the interrelationships of species, as well as the evolutionary processes which have led to their differences.

Development of Social Behavior Ethel Tobach, Curator, expanded her comparative studies of the social development and reproductive behavior of three species of sea hares. The sea hare is an

hermaphroditic marine mollusk which is not self-fertilizing. Robert Stolberg, Scientific Assistant, also worked on the project, which is being carried out both at the Museum and on the coast of Brittany, France.

Dr. Tobach with Joseph L. DeSantis, Scientific Assistant, also conducted a computer analysis of the changing relationships among litter mates and their dams in two species of the common desert spiny mouse. In another project, she observed the reactions of three strains of Norway rats in adjusting to a new environment—with litter mates, with litter mates and dam, and alone.

Electric Fish Experiments Peter Moller, Research Associate, conducted several experiments on the social and non-social behavior of electric fish both in the field and in the laboratory. In the strongly electric fish, he studied prey selection and predatory strategies; in the weakly electric fish, he examined spacing and orienting behavior. Dr. Moller is also investigating the role of light and temperature, electric fields, object preference and aquatic conductivity in the behavior of electric fish.

Army Ant Studies Research Associate Howard R. Topoff studied how army ants recruit nest mates when they find a new food or nest location, and found that a specific chemical other than that deposited during exploration by workers is emitted. The source of the chemical has not yet been found. To verify the effect of stimulation within a colony, he switched broods at different stages of the ants' nomadic cycles. He found that newly developed workers can stimulate the colony to begin a new nomadic phase. This work was carried out at the Southwestern Research Station.

In another project, Dr. Topoff discovered that adult harvester ants scrape off the thin pupal skin of developing worker ants in response to a chemical secreted by the pupae.

Feeding Behavior in Pigeons and Rats Using high-speed photography, H. Philip Zeigler, Research Associate, examined pigeon beak opening behavior during feeding, and found that the two beaks open in direct proportion to the size of the seed about to be grasped. In addition, he and J. Martin Wild, University of Auckland, New Zealand, identified and described the neurons involved in beak opening and closing.

Dr. Zeigler also used videotape observations of feeding rats to describe the space-time relationship and organization of movement patterns involved in eating and drinking.

Cockroach Bus Riders? Betty L. Faber, Research Associate, continued her work with cockroaches.

At the request of the New York City Transit Authority, she investigated various means of controlling cockroaches on city buses and in bus terminals. Her other research included monitoring a marked population of American cockroaches in order to discover the developmental variables which affect the ability to fly and to analyze behavioral changes in individual members of the population.

Chemical Factors in Social Behavior Research Associate Cheryl F. Harding investigated the effects of hormones on social, spatial and reproductive behavior in a breeding colony of zebra finches at the Museum. Research Associate Carol Ann Simon studied chemical and neural factors in homing and social behavior in the iguanid lizard, *Sceloporus jarrovi*, at the Southwestern Research Station.

Spatial Adjustment in Fish Lester R. Aronson, Curator Emeritus, continued his investigation of sensory systems in the behavior of fish. *Kribensis*, a cichlid fish, appears to adjust its settling behavior to the dimensions of the shelter it is in. Dr. Aronson has found that the fish apparently is using "edge" characteristics to make visual and postural accommodations.

Student Involvement During the year, students from the junior high to graduate school levels worked with members of the staff. Many of the graduate and undergraduate students were supported by federal grants. Financial support was also provided by Mrs. Hart Fessenden and by the Lerner Marine, Theodore Roosevelt and T.C. Schneirla Memorial Funds.

Staff Activities Besides their regular teaching assignments at Columbia University and the City University of New York, the staff gave talks to the general public and presented the department's work to the media and to various scientific organizations and universities.

Dr. Tobach spoke on Margaret Mead to the Massachusetts Psychological Association in May. She received the Award for Contributors to Science from the New York Metropolitan Chapter of the Association for Women in Science, and was elected secretary of the International Marine Biological Conference, to be held at Concarneau, France, in May, 1980.

Dr. Harding was awarded the George M. Shuster Fellowship of Hunter College. Dr. Zeigler gave an address to the first annual meeting of the Association for Chemoreception Sciences, as did Dr. Aronson to the Belfast Conference of the Society for Experimental Biology.

Three Associates were appointed Research Associates: Drs. Faber, Harding and Simon. Dr. Aronson



Dr. Tobach and assistant in Concarneau, France.

was elected Curator Emeritus.

During the year, W. Douglas Burden, a Museum trustee who helped found the department, died at age 80. His contributions to the understanding of a variety of species of amphibians, fish and insects were significant and remain a monument to his commitment to natural history and the study of animal behavior.

Scientific Publications:

Aronson, Lester R. and Madeline L. Cooper
1979.

Amygdaloid hypersexuality in male cats re-examined. *Physiol. Behav.*, vol. 22, pp. 157-265.

Belbenoit, Pierre, Peter Moller, Jacques Serrier and Stephen Push
1979.

Ethological observations on the electric organ discharge behaviour of the electric catfish, *Malapterurus electricus* (Pisces). *Behav. Ecol. Sociobiol.*, vol. 4, pp. 321-330, figs. 1-5, 1 table.

Bissinger, Barbara E. * and Carol Ann Simon
1979.

Comparison of tongue extrusions in representatives of six families of lizards. *Jour. Herpetol.*, vol. 13, no. 2, pp. 133-139.

Cooper, Madeline L.
See Aronson and Cooper above

Notes:

1. In the bibliographies, the names of members of the staff and Fellows of the American Museum of Natural History appear in regular type.
2. In the bibliographies, an asterisk appears beside the names of graduate students whose work is being sponsored by members of the staff of the American Museum of Natural History.

Harding, Cheryl F. and Brian K. Follett
1979.

Hormone changes triggered by aggression in a natural population of blackbirds. *Science*, vol. 203, pp. 918-920.

Miller, Maria G., H. Philip Zeigler, and A. Miller
1978.

Trigeminal deafferentation and feeding behavior patterns in the pigeon (*Columbia livia*). *Jour. Comp. Physiol. Psychol.*, vol. 92, pp. 1025-1040.

Moller, Peter, Jacques Serrier, Pierre Belbenoit and Stephen Push
1979.

Notes on ethology and ecology of the Swashi River mormyrids (Lake Kainji, Nigeria). *Behav. Ecol. Sociobiol.*, vol. 4, pp. 357-368, figs. 1-5, 1 table.

See also Belbenoit, Moller, Serrier and Push above

Rettenmeyer, Carl, Howard R. Topoff, and John Mirenda
1978.

Queen retinues of army ants. *Ann. Entomol. Soc. Amer.*, vol. 71, pp. 519-528.

Simon, Carol Ann

See Bissinger and Simon above

Shurtleff, David and Ethel Tobach
1979.

Neonatal rat pups' (Long-Evans DAB) behavioral response to thermal stimuli. *Bull. Psychon. Soc.*, vol. 13, no. 2, pp. 75-77.

Tobach, Ethel

See Shurtleff and Tobach above

Topoff, Howard R.

See Rettenmeyer, Topoff and Mirenda above and Topoff and Mirenda below

Topoff, Howard R. and John Mirenda
1978.

Precocial behaviour of callow workers of the army ant *Neivamyrmex nigrescens*: importance of stimulation by adults during mass recruitment. *Anim. Behav.*, vol. 26, pp. 698-706.

1978.

In search of the precocial ant. In B. Burghardt and M. Bekoff, eds., *Behavioral development: evolutionary aspects*. Garland Publishing Co., New York, pp. 81-100.

Zeigler, H. Philip, V. Holland, J. Martin Wild, and Donald Webster
1978.

Intracranial self-stimulation from endbrain

regions in the pigeon. *Physiol. Behav.*, vol. 21, pp. 387-394.

See also Miller, Zeigler and Miller above

Department of Anthropology

The Department of Anthropology's study of man has placed the American Museum in the forefront of American anthropological research. The department embraces three of anthropology's major subdisciplines: cultural anthropology, physical anthropology and archeology.

The department was deeply saddened by the loss of Margaret Mead, who is memorialized elsewhere in this Report. She was a member of the department for over 50 years, and her contributions are unparalleled. Shortly before her death, the Museum launched a major effort to support the activities of the department in her name. The Margaret Mead Fund for Anthropology will stand for years to come in commemoration of her service to science and to humanity.

Work on Exhibits The department was involved with presenting the successful exhibition POMPEII AD79. Work continued on the Gardner D. Stout Hall of Asian Peoples, which will be the single largest exhibition space in the Museum. The department also continued research and planning for exhibits on Tibet, the gold of Colombia and on musical instruments of the world.

Staff Activities David Hurst Thomas, Chairman and Associate Curator, completed archeological excavations at Gatecliff Shelter, Nev., where he has been working since 1973. During the two month field season, bedrock was reached, revealing archeological deposits roughly 8000 years old. James Santini, U.S. Representative from Nevada, was instrumental in raising funds for the stabilization and preservation of Gatecliff Shelter, which has been placed on the National Registry of Historic Sites. Analysis of the Gatecliff materials is proceeding rapidly under a grant from the National Science Foundation. Dr. Thomas also spent two months supervising archeological field work on St. Catherines Island, with support from the Edward John Noble Founda-

tion. This project, now in its fifth year, involves research on cultural ecology and early mortuary complexes on the island, which was first occupied 4000 years ago. A regional random sample of the island was completed; nearly 130 sites were partially excavated.

Dr. Thomas published a book entitled *Archaeology*, dealing with contemporary method and theory in the subject; several examples were drawn from Museum expeditions. He also attended the third Taniguchi Conference in Osaka, Japan, and lectured at the University of Tennessee, University of Washington, Central Washington State University,

New York University and at the American Ethnological Society meetings in Vancouver.

Slash-and-Burn Technology Robert L. Carneiro, Curator, continued his research on the technology of slash-and-burn cultivation and completed a paper describing his observations on forest clearance among the Yanamamo Indians of Amazonia. He participated in a symposium at the University of Texas and a conference at Hamilton College dealing with theories of the origin of the state. He also completed a paper analyzing and criticizing Julian Steward's views on cultural evolution.



Margaret Mead, who died November 15, 1978, was many things in her 52-year career with the American Museum of Natural History: pioneer anthropologist, psychologist, teacher, lecturer, writer—and member of the family.

She was called a legend in her own time, the best known social scientist, and folk heroine to young people the world over. To most Americans, she was anthropology. In a moving ceremony January 20, she was posthumously awarded the Presidential Medal of Freedom—the nation's highest civilian award.

From the time she made her landmark expedition to Samoa as a young woman of 24 until she was felled by cancer, her pace never slackened. In her teaching, her writing, her public speaking—in her exuberant love of people—she opened minds to new ideas and enlarged conceptions of family life, national character, cultural change, problems of the environment, food, population, war and peace. Her view of human history as a whole gave us insight into our own humanity.

Today, the Margaret Mead Fund for the Advancement of Anthropology stands as a living memorial to her work—to her special vision of anthropology and to her way of illuminating its relevance for all mankind.

"I have spent most of my life studying the lives of other peoples," she once said, "so that Americans might better understand themselves." Hers was a tradition of excellence, a legacy of hope and a labor of love.

Stanley A. Freed, Curator, continued his long-term study on the effects of urbanism in Shanti Nagar, a village in north India, working in collaboration with Ruth S. Freed, Research Associate. The study focused on cultural change, its causes, and the sequences of adjustment. Field notes are now being indexed, and the coded census and economic information are being entered on punch cards for computer analysis.

Enid Schildkrout, Associate Curator, completed her fieldwork in Kano, Nigeria, on the economic roles of children in Nigerian society. In addition she delivered papers at the African Studies Association Annual Meeting in Baltimore; the Association of Social Anthropologists, York, England, and the Conference on Women and Work in Africa, University of Illinois.

Ian Tattersall, Associate Curator, studied Malagasy primates at major European museums in order to begin work on a comprehensive overview of this group. He also completed his analysis of data gathered earlier on the crab-eating macaques of Mauritius and on the brown lemurs of Mayotte.

Inca City Mapped Craig Morris, Assistant Curator, began a new phase in his study of the Inca city of Huanuco Pampa, Peru. Under a grant from the National Science Foundation, he is analyzing 2,000,000 ceramic shards from the site. He is also preparing a topographic and architectural base map of the city, showing its nearly 4000 buildings. Dr. Morris served as scientific advisor to an exhibit of photographs of Nazca ground drawings, and he did preliminary planning for the upcoming "Gold of El Dorado" show.

The late Margaret Mead, Curator Emeritus, was active until the end of her life, participating in the Second Margaret Mead Film Festival and lecturing at the University of Cincinnati, the United Nations, and the University of California (please also see page 13).

Harry L. Shapiro, Curator Emeritus, devoted most of his time to completing a biography of Professor Earnest Hooton, to be published by Columbia University. Junius B. Bird, Curator Emeritus, continued his search in Panama for early man sites which could clarify the relationships between North and South America during the late Pleistocene. Gordon F. Ekholm, Curator Emeritus, continued his curatorial duties of assisting visiting scholars and handling the correspondence and loans relating to the Mesoamerican collections. Philip C. Gifford, Scientific Assistant, supervised the departmental loan program, processing a total of 27 outgoing loans and 31 gifts. Dr. Gifford was also appointed scientific advisor for the renovation and reinstallation of the Hall of Pacific Peoples.

Priscilla Ward, Scientific Assistant, assisted

Dr. Tattersall in researching the systematics of the Lemuriformes of Madagascar and in supervising the physical anthropology collections.

Walter A. Fairservis, Jr., Research Associate, continued to serve as scientific advisor for the Gardner D. Stout Hall of Asian Peoples and to conduct research on the Harappan script.

Carin Burrows, Research Associate, began work on the Tibetan section of the Hall of Asian Peoples and on a special exhibit dealing with Tibetan religious art.

Rhoda Metraux, Research Associate, continued her analysis of latmul materials and her cross-cultural study of projective test materials administered to university-age students in seven cultures. Dr. Metraux has also been serving as Dr. Mead's literary executor, planning the ultimate disposition of her archival materials.

Barbara Conklin, Coordinator of the Curatorial Service Program, directed a major renovation of anthropological storage, with special emphasis on inventory, sorting, labelling and restoring by place of origin. Conservation efforts were concentrated on ethnographic textiles, Northwest Coast masks and Tibetan bronzes. In addition, Mrs. Conklin visited, and consulted with, several other institutions in order to exchange relevant information regarding conservation and storage practices.

Scientific Publications:

Carneiro, Robert L.
1978.

The knowledge and use of rain forest trees by the Kuikuru Indians of central Brazil. *In* Ford, Richard L., ed., *The nature and status of ethnobotany*. *Anthropol. Papers, Univ. of Michigan*, vol. 76, pp. 201-216.

1979.

Tree felling with the stone ax: an experiment carried out among the Yanomamo Indians of southern Venezuela. *In* Kramer, Carol, ed., *Ethnoarchaeology: implications of ethnography for archaeology*. Columbia Univ. Press, New York, pp. 21-58.

1979.

[Reply to] On Price and Carneiro on causality, by Thomas Bargatsky. *Current Anthropol.*, vol. 20, pp. 156-157.

1979.

[Review of] War, its causes and correlates, Nettleship, Martin H., R. Sale Givens, and Anderson Nettleship, eds., and Discussions on war and human aggression, Givens, R. Dale and Martin Nettleship, eds., *Amer. Anthropol.*, vol. 81, pp. 187-188.

See also Kozak, Baxter, Williamson and Carneiro below.

Freed, Ruth S. and Stanley A. Freed
1979.

Shanti Nagar: The effects of urbanization in a village in North India. 3: Sickness and Health. *Amer. Mus. Anthropol. Papers*, vol. 55, pt. 5, pp. 285-354.

Gifford, Philip C.
1979.

Uli figures, Bulletin No. 1 Musee Barbier-Muller, Geneva.

Kay, R. F., R. W. Sussman and Ian Tattersall
1978.

Dietary and dental variations in the genus *Lemur*, with comments concerning dietary-dental correlations among Malagasy primates. *Amer. Jour. Phys. Anthropol.*, vol. 49, no. 1, pp. 119-127.

Kozak, Vladimir, David Baxter, Laila Williamson and Robert L. Carneiro
1979.

The Heta Indians: fish in a dry pond. *Amer. Mus. Anthropol. Papers*, vol. 55, pt. 6, pp. 349-434.

Layton, Thomas and David Hurst Thomas
1979.

The archaeology of Silent Snake Springs, Humboldt County, Nevada. *Amer. Mus. Anthropol. Papers*, vol. 55, pt. 3, pp. 249-270.

Mead, Margaret
1978.

An anthropologist's search for a good linguistic education for her child. *Parents League Rev.*, vol. 12, p. 4.

1978.

The conservation of insight—educational understanding of bilingualism. *Teachers College Record*, vol. 79, no. 4, pp. 705-721.

1978.

The contribution of anthropology to the science of the future. In Maruyama, Magoroh and Arthur M. Harkins, eds., *Cultures of the Future*. Mouton, The Hague, pp. 3-6.

1978.

Culture and Commitment: the new relations between the generations in the 1970s. Doubleday, New York, 2nd ed., revised, 178 pp.

1978.

The evocation of psychologically relevant responses in ethnological field work. In Spindler, George D., ed., *The making of psychological*

anthropology. Univ. of Calif. Press, Berkeley and London, pp. 425-437.

1978.

Individual responsibility with a new technological framework. In Segerstedt, Torgny T., ed., *The Frontiers of Human Knowledge. Lectures at the Quincentenary of Uppsala University, 1977*. Humanities Press, Atlantic Highlands, pp. 159-162.

1978.

Institutional expressions of ideas: The Menninger Foundation and its associated institutions, 1943-1977. In Smith, Sydney, ed., *The Human Mind Revisited: essays in honor of Karl A. Menninger*. Internatl. Univ. Press, New York, pp. 473-492.

1978.

Knowing, reaching and serving the wounded, disadvantaged and vulnerable of our world. In Beiser, Morton, et al, eds., *Today's Priorities in Mental Health: knowing and doing*. Symposia Specialists, Miami, pp. 61-69.

1978.

Social determinants of male and female roles and relationships. In Lennart, Levi, ed., *Society, Stress and Disease*, vol. 3, *The Productive and Reproductive Age*. Oxford Univ. Press, New York, pp. 22-29.

1978.

[Foreword to] *Growing up in New Zealand*, by Jane and James Ritchie. Allen and Unwin, Sydney, pp. ix-xii.

1978.

[Foreword to] *The man-made future*, by C. H. Waddington, Croom Helm, London, p.7.

1978.

[Foreword to] *Namkwa: life among the bushman*, by Hans-Joachim Heinz and Marshall Lee. Jonathan Cape, London, pp. xi-xiii.

Morris, Craig

1978.

The archaeological study of Andean exchange systems. In Charles Redman, ed., *Social Archaeology: beyond subsistence and dating*. Academic Press, New York, pp. 315-327.

1978.

Maize beer in the economics, politics and religion of the Inca empire. In Gastineau, Clifford and William J. Darby, eds., *Fermented Food Beverages in Nutrition*. Academic Press, New York, pp. 21-34.

Morris, Craig and *Julian I. Santillana*

1979. *Perspectiva Arqueologica de la economia Inca. Historicas*, 2. Lima, Peru, pp. 244-263.

Schildkrout, Enid

1979. Changing economic roles of children in comparative perspective. *In* Oppong, C., G. Adaba, M. Bekombo-Priso and J. Moge, eds., *Marriage, fertility and parenthood in West Africa. Changing African Family*, no. 4, pt. 1, pp. 289-307.

1979. The ideology of regionalism in Ghana. *In* Shack, W. S. and E. P. Skinner, eds., *Strangers in Africa*. Univ. of California Press, Berkeley, pp. 183-207.

1979. Age and gender in Hausa society: socio-economic roles of children in urban Kano. *In* LaFontaine, J. S., ed., *Sex and age as principles of social differentiation*. Assoc. of Soc. Anthropol., no. 17, Academic Press, London, pp. 109-137.

Schwartz, J. H., Ian Tattersall and Niles Eldredge

1978. Phylogeny and classification of the primates revisited. *Yearbook Phys. Anthropol.*, vol. 21, pp. 95-133.

Schwartz, J. H. and Ian Tattersall

1979. The phylogenetic relationships of Adapidae (Primates, Lemuriformes). *Amer. Mus. Anthropol. Papers*, vol. 55, pt. 4, pp. 271-283.

Shapiro, Harry L.

1979. Forensic Anthropology. *Ann. of the New York Acad. of Sci.*, vol. 318, pp. 3-9.

Tattersall, Ian

1978. Behavioral variation in *Lemur mongoz*. *In* Chivers, D. J. and K. A. Joysey, eds., *Recent advances in primatology*. Academic Press, vol. 3, London, pp. 127-132.

See also Kay, Sussman and Tattersall and Schwartz, Tattersall and Eldredge and Schwartz and Tattersall above

Thomas, David Hurst

1978. Arrowheads and Atlatl Darts: how the stones got the shaft. *Amer. Antiquity*, vol. 43, no. 3, pp. 461-472.

1979.

Archaeology. Holt, Rinehart and Winston, Inc., New York, 510 pp.

Thomas, David Hurst, *Grant D. Jones, Roger S. Durham and Clark Spencer Larsen*

1978. The anthropology of St. Catherines Island, 1: Natural and cultural history. *Amer. Mus. Anthropol. Papers*, vol. 55, pt. 2, pp. 155-248.

See also Layton and Thomas above

Abstracts and Popular Publications:

Thomas, David Hurst

1979. Remembering Margaret Mead. *New York Magazine*, February 5, 1979, p. 11.

Astronomy and the American Museum—Hayden Planetarium

The Planetarium, one of the Museum's best known facilities, serves as an exchange point between research astronomy and the general public. It carries out this function through its Sky Shows, exhibitions, formal course offerings, research library and bookstore as well as by making its staff and their expertise available to news media. Special shows and other activities are also held to acquaint new audiences with the Planetarium's programs.

The Sky Show is the main offering at the Planetarium, and last year 421,161 attended its programs. A total of 537,478 persons attended all public performances in the Planetarium; 94,734 students attended special Sky Show presentations designed to complement their studies.

Sky Shows The Sky Show in the summer and fall was "UFOs and IFOs." That was followed by "Star of Wonder," the Planetarium's annual Christmas show investigating the astronomical possibilities behind the Star of Bethlehem. In the winter, coinciding with the King Tut show at the Metropolitan Museum, the Planetarium presented "Stars of the Pharaohs," dealing with Egyptian astronomy. In the spring, in conjunction with POMPEII AD79, the Planetarium presented "Last Nights of Pompeii."

The Planetarium continued to present Laserium,

the Cosmic Laser Light Show, with attendance totaling 116,317 persons. Several new Laserium shows are now being developed.

Pilot Training A special flight safety program, attended by 460 local pilots, was held in conjunction with the Federal Aviation Administration. Interest generated by this special program was noticeable in an increased enrollment in the Planetarium's aviation ground school courses. The Planetarium also cooperated with NASA and the American Institute of Aeronautics and Astronautics in presenting a publisher's information evening at which representatives of major print media were briefed on the resources of the two organizations, and of the Perkin Library.

The Planetarium made a special presentation to 150 sailors in the Marion-to-Bermuda Cruising Race, giving them information about the sky and tips on navigation.

Voyager Photos Shown In September, the first floor received an acoustical, hung ceiling, greatly reducing the noise problem in corridors and adjacent rooms.

The Planetarium's "art wall" featured exhibits by Planetarium Art Supervisor Helmut K. Wimmer, and by Mexican artists Leonardo Nierman and Jorge Espinosa. The Planetarium also presented the only New York showing of photographs of Jupiter from the Voyager I mission. These were followed by an exhibit from the Smithsonian Institution of moon photographs taken by the U.S. space program, timed to commemorate the 10th anniversary of the Apollo 11 landing.

Perkin Library The Perkin Library is probably the best astronomical and aerospace reference library open to the public in the world. Over 1000 information requests were received this past year.

The Library is beginning to subscribe in microfiche form to some expensive and voluminous professional publications, to conserve both money and space. New acquisitions include about 1500 photographs transferred from the Museum's photographic collection.

Staff Activities Mark R. Chartrand, III, Chairman and Associate Astronomer, wrote the scripts for "UFOs and IFOs" and "Stars of the Pharaohs." He chaired a committee to consider revisions for the Museum's annual report, and served on the Council of the Scientific Staff. He and Thomas A. Lesser, Senior Lecturer, represent the Planetarium on a joint committee to consider an automation system for the Planetarium. Dr. Chartrand continued as adjunct assistant professor of astronomy at Fordham University, Lincoln Center Campus. Since the spring, he has been an occasional science commentator on WNET-TV.

Dr. Chartrand chaired a technical paper session at the biennial meeting of the International Planetarium Society in Washington in August. He also represented the department at the triennial meeting of the International Planetarium Directors Conference in Nagoya, Japan, and at three NASA events: a briefing on the results of the Pioneer Venus mission, a live broadcast of the Voyager I Jupiter mission, and the third Princeton Conference on Space Colonies and Space Manufacturing. He presented several talks



Photo by Brian Hamill

Not all the stars appeared inside the Planetarium at the Sky Shows last year. Here's Woody Allen, who turned up for a fake rainstorm and a scene in his movie, "Manhattan." During the past two years, the Museum has been shown in several films, including "Bloodline," "The Heretic," "Kramer vs. Kramer," and "The Last Embrace." The Museum received more than \$10,000 in location fees, and the city administration cheered, happy to see movies being made in New York City. Filming is scheduled so as not to interfere with visitors. In addition to welcome revenue, the Museum receives valuable exposure and publicity.

around the country and served as science director of "Eclipse over Big Sky," a monitoring program for the total solar eclipse of February 26.

Kenneth L. Franklin, Astronomer, continued to oversee the exhibition program. He taught evening courses at the Planetarium, and appeared on several news programs about astronomical events. He also wrote and produced the Sky Show "Last Nights of Pompeii," and presented eight special shows. He serves on the Library Committee of the Museum, and is Press Officer for the American Astronomical Society. In June, he attended a conference on the Search for Extraterrestrial Intelligence at the Ames Research Center of NASA. He visited Seton Hall as part of the Harlow Shapely Visiting Professor Program of the American Astronomical Society, and is a member of the advisory panels of Science Digest and the American Institute of Physics. He continues to serve as editor of the astronomy section of the World Almanac.

Mr. Wimmer continued to be involved in the artistic activities of show production. Gwendolyn Gwyn was appointed Public Affairs Coordinator.

New Audio Tour Allen Seltzer, Education Coordinator, continued his responsibility for formal courses and special Sky Shows for school groups. He also supervised the darkroom and photography studio, producing the color prints of the Voyager I images of Jupiter that were displayed in the Planetarium. The FAA-sponsored safety seminar was held under his guidance. He revised a number of school shows and the printed material supplied to teachers, and coordinated the audio tour of the Hall of the Sun for school groups. Close to 10,000 students took the tour in its first year. Mr. Seltzer continued as an adjunct faculty member at Fordham University, Lincoln Center Campus, and taught several courses at the Planetarium. He attended the International Planetarium Society meeting in August, and presented a technical paper "Photographic Techniques for Planetarium Applications." He participated in an expedition to view the total solar eclipse in February.

Mr. Lesser was responsible for show production and presentation. He is involved in ongoing work on the Sky Show's special effects and all-sky projection systems. He also assisted Mr. Wimmer with the display of temporary exhibits.

Jeffrey I. Mennin, Business Manager, continued to handle the business and operational affairs of the Planetarium.

David Dundee completed his second year of internship and accepted a senior position at the Fernbank Science Center in Atlanta. Jon Bell continued into his second year as an intern, and Fujiko Worrell joined the staff. The latter participated in an expedition to view the total solar eclipse in February. This is the thirteenth year of the internship program at the Planetarium.

During the year, the Planetarium Shops, under the management of Charles Luker, had sales of \$132,000.

Abstracts and Popular Publications:

Branley, Franklyn M.

1978.

The Nine Planets. Thomas Y. Crowell Co., New York, 100 pp.

1979.

Color: From Rainbows to Lasers. Thomas Y. Crowell Co., New York, 88 pp.

1979.

[Review of] Mysterious Universe by William Corliss. Science Books & Films, AAAS, Washington, D.C.

1979.

[Review of] Who Goes There by Edward Edelson. Science Books & Films, AAAS, Washington, D.C.

Chartrand, Mark R. III

1978.

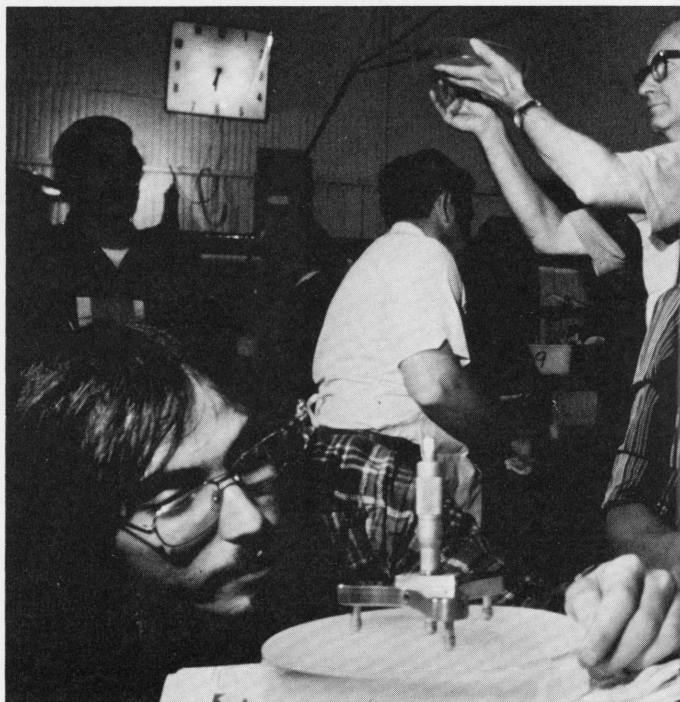
Comet Chasing. *Omni*, vol. 1, no. 1, pp. 24, 26.

1978.

Time Zero. *Ibid.*, vol. 1, no. 2, pp. 18, 20.

1978.

Star of the Magi. *Ibid.*, vol. 1, no. 3, pp. 20, 22.



1979. Happy New Year! *Omni*, vol. 1, no. 4, pp. 20, 22.
1979. Journeys to the Shadow of the Moon. *The New York Times* Travel Section, January 28, pp. 1, 13.
1979. Meteors. *Omni*, vol. 1, no. 5, pp. 20, 22.
1979. Whirlpools in the Sky. *Ibid.*, vol. 1, no. 6, pp. 20, 119.
1979. Turning the Crank. *Ibid.*, vol. 1, no. 7, pp. 16, 138.
1979. Quasars, Blazars, and Spinars. *Ibid.*, vol. 1, no. 8, pp. 18, 134.
1979. Eye in the Sky. *Ibid.*, vol. 1, no. 9, p. 18.
- Franklin, Kenneth L.
1979. Astronomy and Calendar. In *World Almanac*, Newspaper Enterprise Association, pp. 756-792.
- Lesser, Thomas A.
1979. Ancient Egyptian Sky Lore. *Constellation*, Spring Equinox Issue, pp. 3-4.



Evening classes in mirror making for telescopes have been taught at the Planetarium since 1935.

Department of Entomology

With their remarkable diversity and great numbers, insects and spiders provide vital information about evolutionary history. The six curators in this department do research that alters hypotheses about the kind, form, distribution and natural history of these animals. The staff's numerous publications affect overall perceptions about insects and spiders, and about the world they inhabit.

This year, 36,900 specimens were sent in 147 loans to scientists throughout the world, and nearly 112,000 specimens were added to the collection. Approximately half of the department's budget and efforts go toward making the collection of 15.2 million specimens available for research by scientists from other institutions. The curators continued their own research, publication and expeditions to increase knowledge about insects and spiders.

Rove Beetles Lee H. Herman, Jr., Chairman and Curator, continued his work on the Dolicaonina, a subtribe of the rove beetle subfamily Paederinae. He has completed the key, descriptions and hundreds of illustrations, and the section on phylogeny is being written. As an extension of his work on the New World Dolicaonina, Dr. Herman began accumulating specimens for an investigation of the subtribe from the Oriental Region.

He also began work on a rarely collected, anatomically peculiar tribe of Neotropical Paederinae, the Cyliandroxytini.

The Museum accepted for publication Dr. Herman's revision of the South American paederine genus *Stereocephalus*, which had formerly been included in the subtribe Dolicaonina. He demonstrated that it belongs with another subtribe, the Lathrobiina. In the course of his work, he discovered three new species.

On a field trip to California, Washington and Oregon, Dr. Herman collected more than 15,000 insects, most of them rove beetles; his wife, Nancy Herman, collected 4 782 bees, wasps, flies and plant bugs. His collections extended the known geographic ranges of many species of staphylinids and added many previously unrepresented taxa to the collection.

North American Moths Frederick H. Rindge, Curator, continued his studies of moths of the family Geometridae, with emphasis on the subfamily Ennominae. Completing work he began last year, he published a revision of the four North American

species of *Lomographa*.

Dr. Rindge worked on a revision of the genus *Somatolophia*, which contains approximately twelve species from the western United States and Mexico. As a starting point, he made a survey of the approximately 75 described species, including dissections and slide preparations of the male and female genitalia as well as the antennae and legs of both sexes.

Dr. Rindge was also re-appointed research associate in entomology at the Los Angeles County Museum.

Life History of Bees Jerome G. Rozen, Jr., Curator, worked with three problems pertaining to the immature stages and life histories of bees (Apoidea). During June and July, he and Ned Robert Jacobson (with partial support from the Undergraduate Research Program, sponsored by the Reader's Digest Foundation) studied the nesting biology and immature stages of the Holarctic bee genus *Macropis*. Mr. Jacobson found the first nesting site in North America on the Huyck Preserve near Albany. As a result, the life history of *Macropis nuda* (Provancher) can now be compared with several Palearctic species in the same genus. A manuscript is nearing completion presenting the results of this comparison and describing the larva.

Dr. Rozen and his wife, Barbara, with the aid of a grant from the National Geographic Society, went to South West Africa in March to investigate the nesting biology and immature stages of a number of genera of endemic panurgine bees. They gathered information on nesting habits, food preferences, and diurnal and seasonal activity of the solitary bee genus *Poecilomelitta*, and ascertained the mating behavior, food habits, and daily activity patterns of another genus, *Mermiglossa*. Dr. Rozen has now amassed data concerning the life histories of all genera of southern African panurgine bees.

Silverfish and Bugs Pedro Wygodzinsky, Curator, continued work on European Nicoletiinae, blind subterranean or cavernicolous silverfish, and is preparing a paper on the species, *Nicoletia meinerti*, as well as the description of a new genus that will include most European species of Nicoletiinae.

He redescribed and also illustrated for the first time the emesine reduviid (thread-legged bug), *Empicoris seorsus* Bergroth, from New Zealand.

With Kathleen Schmidt, Scientific Assistant, he took up a temporarily suspended research project, the revision of the heteropteran family *Enicocephalidae*. This family of unique-headed bugs is found throughout the world.

The monograph Dr. Wygodzinsky has co-authored with Herman Lent, Research Associate, on the reduviid subfamily Triatonimae was accepted for publication in the Museum's *Bulletin*.

Arachnids Norman I. Platnick, Associate Curator,

conducted research on the theory of systematics and biogeography and on the systematics of arachnids. He continued his collaboration with Gareth J. Nelson, Department of Ichthyology, on a book devoted to the history, methods, and results of systematics and biogeography. Some of the results were presented in a paper, "The Purposes of Biological Classification," at the Sixth Biennial Meeting of the Philosophy of Science Association in San Francisco. Dr. Platnick and Leslie F. Marcus, Department of Invertebrates, served as conference summarizers for the 12th Annual Numerical Taxonomy Conference at Stony Brook, N.Y. Dr. Platnick also contributed a paper on recent advances in systematic theory entitled "Philosophy and the Transformation of Cladistics" to a symposium in Richmond, Virginia, and served as a discussant for the Museum's symposium "Vicariance Biogeography: A Critique."

Dr. Platnick's revisionary work on various groups of arachnids continued with the artistic assistance of Mohammad Umar Shadab, Scientific Assistant. He reviewed the spider genus *Anapis*, and synonymized two previously separate genera with *Anapis*. Fifteen of the 21 recognized species were newly described. His review of genera *Anapisona* and *Pseudanapis* showed that most of the species formerly placed in *Pseudanapis* actually belong elsewhere and that the distribution of the redefined genus includes tropical America, the Congo, and various islands of the west Pacific. Dr. Platnick also did taxonomic work on the spider families Gnaphosidae, Symphytognathidae, and Palpimanidae, and on the arachnid order Ricinulei.

Willis J. Gertsch, Curator Emeritus, collaborated with Dr. Platnick on a revision of the spider family Mecicobothriidae, a group of unusual tarantula-like spiders restricted to the western United States and Argentina.

Plant Bugs Continuing his monographic studies on the plant bug subfamily Phylinae of Southeast Asia and the western tropical Pacific, Randall T. Schuh, Assistant Curator, completed descriptive work for the region on one more genus, *Cam-pylomma*. He also prepared a grant proposal to the National Science Foundation to spend six months in the Indo-Malayan Region collecting Phylinae.

Dr. Schuh finished, and is in the final stages of, preparing manuscripts resulting from the following cooperative projects: a revision of the plant bug genera *Beamerella* and *Hambletoniola* (with Thomas J. Henry, Pennsylvania State Department of Agriculture); a description of a new species of *Myremecophyes* from Oregon, a genus previously known only from Europe and Asia (with John D. Lattin, Oregon State University); and a description and phylogenetic analysis of a new leptopodomorphan bug from Ecuador (with John T. Polhemus of Denver).



Two Gold Medals—the Museum's highest award for scientific achievement—were awarded by Trustees this year. Sir Karl Raimund Popper, British philosopher and historian of science, is shown above receiving the 1979 Gold Medal Award for Distinguished Service to Science from Mrs. Constantine Sidamon-Eristoff, a Vice President of the Museum, at the May meeting of the Board of Trustees. His work in the philosophy of science was cited as offering thought-provoking questions about the direction and purpose of scientific research.

In November, 1978, Norman D. Newell, Curator Emeritus, Department of Invertebrates, was awarded the Gold Medal for Distinguished Achievement in Science at the Board's fall meeting. Dr. Newell's work in fossil invertebrates led to his recognition as a leading scientist in the field.

Dr. Schuh spent a week collecting in the Appalachians with Dr. Wygodzinsky and Kathleen Schmidt, and also participated in the Museum's symposium on vicariance biogeography. He completed the second of three years as managing editor of *Systematic Zoology*.

Scientific Publications:

Coscarón, Sixto

See Wygodzinsky and Coscarón below

Harper, Charles W., Jr. and Norman I. Platnick
1978.

Phylogenetic and cladistic hypotheses: a debate. *Syst. Zool.*, vol. 27, pp. 354-362, 1 fig.

Platnick, Norman I.

1978.

On East Asian *Orthobula* (Araneae, Clubionidae). *Acta Arachnol.*, vol. 27, pp. 43-47, figs. 1-6.

1978.

[Review of] *The Arthropoda: Habits, Functional Morphology, and Evolution*, by S. M. Manton. *Syst. Zool.*, vol. 27, pp. 252-255.

1978.

On Australian *Eilica* (Araneae, Gnaphosidae). *Bull. British Arachnol. Soc.*, vol. 4, pp. 226-227, figs. 1-6.

1978.

Adaptation, selection, and falsifiability. *Syst. Zool.*, vol. 27, pp. 347-348.

1978.

Classifications, historical narratives, and hypotheses. *Ibid.*, vol. 27, pp. 365-369, 1 fig.

1979.

On *Josa alba* Mello-Leitão (Araneae, Anyphaenidae). *Jour. Arachnol.*, vol. 6, pp. 157-158, figs. 1-2.

1979.

A revision of the spider genus *Barrisca* (Araneae, Rhoicininae). *Ibid.*, vol. 6, pp. 213-217, figs. 1-6.

1979.

Gaps and prediction in classification. *Syst. Zool.*, vol. 27, pp. 472-474, 1 fig.

1979.

[Review of] *Arachnology*, edited by P. Merrett. *Ibid.*, vol. 28, pp. 115-117.

Platnick, Norman I. and Eugene S. Gaffney

1978.

Systematics and the Popperian paradigm. *Syst. Zool.*, vol. 27, pp. 381-388.

Platnick, Norman I., and Nicolas Paz S.

1979.

On the *Cryptocellus magnus* Group (Arachnida, Ricinulei). *Amer. Mus. Novitates*, no. 2677, pp. 1-9, figs. 1-11, 1 table.

Platnick, Norman I. and Mohammad Umar Shadab

1978.

A review of the spider genus *Mysmenopsis* (Araneae, Mysmenidae). *Amer. Mus. Novitates*, no. 2661, pp. 1-22, figs. 1-71.

1978.

A review of the spider genus *Anapis*, with a dual cladistic analysis. *Ibid.*, no. 2663, pp. 1-23, figs. 1-64.

1979.
A revision of the Neotropical spider genus *Echemoidea*, with notes on other echemines (Araneae, Gnaphosidae). *Ibid.*, no. 2669, pp. 1-22, figs. 1-59.
1979.
A review of the spider genera *Anapisona* and *Pseudanapis* (Araneae, Anapidae). *Ibid.*, no. 2672, pp. 1-20, figs. 1-59.
- See also Harper and Platnick above and Raven and Platnick and Nelson and Platnick, Dept. of Ichthyology, below
- Raven, Robert J. and Norman I. Platnick
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See Platnick and Shadab above
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1979.
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Department of Herpetology

What makes it possible for all-female species of lizards to reproduce? And how can the bio-medically important skin secretions of tropical poison-dart frogs provide clues to the evolution of these colorful animals? These are typical of some of the in-depth, long-term research topics that members of this department are involved in, both in the field and in the departmental laboratories at the Museum.

Richard G. Zweifel, Chairman and Curator, resumed his studies of the reptiles and amphibians of New Guinea and completed two papers on the systematics of lizards and frogs. He continued ecological studies of turtles and snakes at the Kalbfleisch Field Research Station and a cooperative study with Associate Curator Charles J. Cole of the herpetofauna of St. Catherine's Island. The latter project is supported by the Edward John Noble Foundation, and investigates the growth, movements and survival of individual lizards and snakes. Almost 700 lizards and snakes have been marked and many of them recaptured one or more times.

Research on the department's breeding colony of kingsnakes (*Lampropeltis getulus*) has been expanded to include blood studies. Dr. Zweifel and Research Associate Herbert C. Dessauer, Professor of Biochemistry, Louisiana State University School of Medicine, are examining the inheritance of blood proteins that will provide the first such information documented through three generations of snakes.

Poison-Dart Frogs Charles W. Myers, Curator, conducted field work in widely separated parts of South America on poison-dart frogs. In October, he traveled into one of the wettest areas on earth—mountains rising out of lowland rain forest between the Pacific Coast of northwestern Colombia and the higher Andes to the east. A week-long search near his highest camp yielded two specimens and some tadpoles of a rare poison frog that had been found only once before. This frog was one of a dwindling number of species still to be sampled in a study of the biomedically important alkaloids that occur only in the defensive skin secretions of tropical poison-dart frogs. The long-term study is a collaboration between Dr. Myers and John W. Daly of the National Institutes of Health. Field work is supported by a grant from the Camille and Henry Dreyfus Foundation.

In February and March, Dr. Myers worked in southern Brazil collecting data on a little-known



Dr. Sarah E. Flanders, right, holding the familiar flag designating the Highlights and History Tour, explains a diorama to Museum visitors.

group of Brazilian frogs that may be related to the poison-dart frogs. He collaborated with Paulo E. Vanzolini, Director of the Museo de Zoologia, Universidade de São Paulo.

Between expeditions, Dr. Myers co-authored manuscripts on frog poison glands studied with the electron microscope, and on a new miniature poison frog with new toxins from the northern Andes. In addition, he advanced his systematic studies of other groups of Neotropical amphibians and reptiles and identified many new South American specimens to be catalogued into the Museum's collections.

Whiptail Lizards Dr. Cole's studies continued to center on parthenogenetic (all-female) whiptail lizards, genus *Cnemidophorus*. At the Southwestern Research Station in Arizona, he and Scientific Assistant Carol R. Townsend collected lizards to augment the Museum's breeding colonies (which now include some fourth generation captive-bred lizards) and to provide material for a variety of research on parthenogenesis. In the laboratory, Dr. Cole continued his experiments to mate parthenogenetic females to males of other species in order to test hypotheses

about the hybrid origin of parthenogenetic forms. In addition, he has studied the chromosomes of parthenogenetically-produced and hybrid young, and compared them with the parental chromosomes.

With Dr. Dessauer, Dr. Cole examined blood and tissue samples as part of a study of protein inheritance in all-female lizards. Continuing his collaboration with Laurence M. Hardy, Louisiana State University, Shreveport, he conducted histological studies on the gonads of lizards of different ages to confirm that no sex-reversal or other developmental peculiarity occurs.

Dr. Cole also continued his work on the systematics of spiny lizards (genus *Sceloporus*) and black-headed snakes (genus *Tantilla*), and on the herpetofauna of St. Catherine's Island.

Curatorial Activity Curatorial activity was facilitated by a continuing grant from the National Science Foundation providing salaries for two Curatorial Assistants. About 4300 specimens were added to the collection and another 4900 were cataloged. More than 5000 specimens were loaned out or returned from other institutions.

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Cole, Charles J.
1978.

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1978.

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1979.

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Myers, Charles W. and John W. Daly
1978.

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1978.

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1979.

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Zweifel, Richard G.
1979.

Variation in the scincid lizard *Lipinia noctua* and notes on other *Lipinia* from the New Guinea region. Amer. Mus. Novitates, no. 2676, pp. 1-21, figs. 1-12.

1979.

A new cryptic species of microhylid frog (genus *Cophixalus*) from Papua New Guinea, with notes on related forms. *Ibid.*, no. 2678, pp. 1-14, figs. 1-8.

Curator C. Lavett Smith, and a field crew collect specimens for survey of inland fishes of New York State.



Department of Ichthyology

This department studies fishes, making use of the diverse tools available to modern students of evolution such as cladistics, geology, paleontology, comparative physiology and biochemistry, ecology and functional morphology. In the course of their work, the curators often collaborate with the staff of other departments.

The well-balanced approach of the department to systematics was once again reflected in the staff's research concerns this year. Curator Donn E. Rosen's interest in the theories of biogeography and a synthetic classification of all fishes provided a broad base for his critical studies of certain groups of fishes and of selected geographic areas. Gareth J. Nelson, Curator, continued his studies of comparative biology theory, including biogeography, while working on revisions of parrot-fishes and catfishes. C. Lavett Smith, Curator and Chairman, concentrated on general ecology and the biology of fishes; he also continued to work on a detailed description of New York State fauna. Curator James W. Atz is pursuing his analysis of the relationship of experimental studies such as comparative physiology to systematics. He is also studying the evolutionary significance in fish of sightlessness, live bearing, and the incubation of eggs in the mouth (oral brooding).

The curatorial staff has been especially involved in the study of biogeography, which deals with the history of the distribution of plants and animals around the world. Dr. Rosen, for example, worked with other departments to organize the successful international symposium, "Vicariance Biogeography: A Critique," held at the Museum in May.

As part of his continuing studies of Middle American fishes, Dr. Rosen made collections in Mexico and Guatemala. He also continued his studies of the biogeography of the Indo-Australian archipelago.

Dr. Nelson published four papers on the methodologies of biogeography and classification, including an analytical review of the history of biogeography. He and Norman I. Platnick, Department of Entomology, made considerable progress on their book on the theory and practices of classification and biogeography. Dr. Nelson also continued his revisionary studies of fishes. In addition, he and Dr. Atz finished another phase of the reorganization of the Dean Memorial Library, completing the binding of reprints of scientific papers into permanent volumes under a grant from Mrs. Beatrice Manice. Dr. Nelson also established an efficient system to control the library's day-to-day operations.

Best Collection of New York Fishes Dr. Smith continued to conduct his survey of the inland fishes of New York State. With support from the New York State Department of Environmental Conservation, field crews collected fishes at 160 locations. The Museum now has the best collection of New York State fishes; moreover it is the only major collection made in the past two decades. A grant from the Vetlesen Foundation has provided for a cataloger to incorporate this material into the permanent collection. The grant also purchased a small boat to help make collections in inaccessible areas and habitats. By the end of the 1980 field season, every major stream in the state will have been sampled.

Dr. Atz continued his work on a handbook on the laboratory use of marine invertebrates, to be published by the National Academy of Sciences.

Nearly 17,000 specimens were added to the collection during the fiscal year; close to 10,000 were cataloged. M. Norma Feinberg, Scientific Assistant, continued to upgrade the collection, but the department must rely heavily on volunteer labor for routine maintenance. This past year, ten volunteers contributed more than 1800 hours to the department under the supervision of Mrs. Feinberg and Carol S. Hutchings.

The department continues an active interest in teaching, and its curators taught courses at New York University, the University of Michigan, and the C.W. Post Center of Long Island University.

The staff is well represented on a number of national scientific organizations. Dr. Rosen was elected secretary of the American Society of Ichthyologists and Herpetologists; Dr. Atz is a member of the Council of the Institute of Laboratory Animal Resources of the National Academy of Sciences. Dr. Smith is a member of the panel reviewing proposals for the second phase of the National Oceanic and Atmospheric Administration's national underwater laboratory habitat.

Scientific Publications:

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1979.

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1978.

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canthe, *Latimeria chalumnae*. *Naturaliste canadien*, vol. 105, no. 2, pp. 63-76.

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See also Randall and Nelson below.

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1979.

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1978.

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See also McAllister and Smith above.

Department of Invertebrates

The intellectual objectives of the department embrace the history of invertebrates from the earliest records to the present, the physical changes of the earth as inferred from invertebrate fossils in stratigraphic and sedimentary context, and biological phenomena ranging from unicellular organisms through the spectrum of invertebrate animals to whole ecosystems.

Norman D. Newell, Curator Emeritus, in addition to receiving a Museum Gold Medal (see page 21), was also elected to the National Academy of Sciences and to the National Academy of Arts and Sciences during the past year.

Collection management was improved with the completion of a five-year program, supported by the National Science Foundation, to curate and recatalog the type specimens of fossil invertebrates. As part of this program, a new computer terminal with a larger memory bank was installed, replacing the old terminal. The NSF also provided the department with an equipment grant which helped to improve research facilities.

The most notable acquisition was the Gordon Nowell-Usticke collection of 10,000 mollusk specimens. Demand for the collections increased: 43 loans were made, 97 scientists carried out research here and 148 shell collectors used the molluscan reference collection.

The department's collection of worldwide, freshwater mussels, many of them endangered or extinct, was reorganized by Douglas C. Smith, consultant. This was supported by the Halpern Malacology Fund.

Staff members held appointments at the City University of New York and Columbia University, and served on dissertation committees at the University of Delaware and Northeastern University.

They also conducted lectures for the Department of Education, participated in the Discovery Tour program, presented seminars and slide shows to amateur groups, and appeared on radio and television programs.

Marine Worms Ernst Kirsteuer, Chairman and Curator, continued his research on marine nemertean worms. With Klaus Ruetzler, Smithsonian Institution, he studied the structure of the proboscis stylets of Caribbean species of *Otocyphlonemertes*. Stylet surfaces were analyzed for the first time with the scanning electron microscope; these examinations proved that the stylets are composed of intertwined rods and not braided, as frequently described in the diagnoses of taxa. Dr. Kirsteuer also studied the effect of a hurricane on nemerteans in a beach at Carrie Bow Cay, Belize, discovering that quantitative distribution values were much lower after the storm.

Roger L. Batten, Curator, continued his investigations of gastropod shell ultrastructure. His study of the heteropod genus *Carinaria*, planktonic carnivorous gastropods, suggested that the genus may have secondarily acquired a shell.

New Family of Limpets Studied Dr. Batten collaborated with James H. McLean, curator of mollusks, Los Angeles County Museum, in a study of a new family of limpets from the Galapagos Rift. They were recovered from a depth of 2400 meters and belong to a suborder thought to have been extinct for more than 200 million years. He also continued his work on the systematics of Permian Malaysian mesogastropods.

Dorothy E. Bliss, Curator, assisted by Research Assistant Jane R. Boyer, prepared a paper on the factor inhibiting premolt limb regeneration in the land crab *Gecarcinus lateralis*. Technical assistance was provided by Scientific Assistant Harold S. Feinberg. Dr. Bliss delivered and submitted for publication her address on the adaptation of land crabs as outgoing president of the American Society of Zoologists, which met in Richmond, Virginia.

William K. Emerson, Curator, studied modern and fossil marine invertebrates, especially mollusks, and described six new species of muricacean gastropods from the Pacific and Atlantic Oceans in a paper coauthored with Anthony D'Atillio, assistant curator of mollusks, San Diego Museum of Natural History. Dr. Emerson collaborated with William E. Old, Jr., Scientific Assistant, on a publication on a new volutid gastropod from the Yucatan Channel, Mexico.

Fossil Dating Efforts Succeed Dr. Emerson's use of the uranium-series method of dating specimens of sea urchins from late Pleistocene terrace sediments was highly successful. The preliminary results

of this investigation, a joint project with Teh-Lung Ku, professor of geology, University of Southern California, hold promise that the technique, which calculates fossil ages by measuring radioactive half-life, can provide the first absolute dates for these fossil deposits. Dr. Emerson also reported progress on an investigation, in cooperation with Dr. McLean of the Los Angeles County Museum and Leslie F. Marcus, Research Associate, of mollusks from western Baja California. He and Mr. Old also began a study of scaphopod mollusks, using the scanning electron microscope.

Dr. Emerson was re-elected a research associate of the San Diego Museum of Natural History. Mr. Old was elected president of the American Malacological Union.

Niles Eldredge, Associate Curator, completed a book with Joel Cracraft, University of Illinois Medical Center, Chicago, on phylogenetic patterns and the evolutionary process. The book details the procedures for reconstructing the history of life.

Such genealogical patterns can be used to construct biological classifications and test hypotheses in macroevolution.

Fossil Marine Animals Studied Research on the visceral paleobiology of Echinodermata, by Bruce N. Haugh, Assistant Curator, concentrated on the extinct fossil forms. The studies were done with Bruce M. Bell, New York State Museum, Albany. Initial data indicate that the biology of the four extant classes of echinoderms has severely biased the systematics of the phylum as a whole.

Dr. Haugh also continued to study the skeletal microstructure of fossil crinoid plates. He served a second term as secretary of the Northeastern Section of the Paleontological Society and was co-chairman of a paleontology technical session at the Geological Society of America's annual meeting in Toronto.

Searching for Clues Curator Emeritus Norman D. Newell and Donald W. Boyd, Research Associate, continued their monographic studies on Permian-Triassic bivalve mollusks. They obtained Triassic bivalves in Wyoming, Idaho and Nevada, and also participated in a conference on fossil mollusks held in Toronto. Their studies are expected to shed new light on the great world wide extinctions of marine life at the close of the Paleozoic Era.

Sidney S. Horenstein, Scientific Assistant, began a study of stone used in New York buildings, verifying geological histories and observing patterns of rock disintegration. Some of the information will be used to match identical stone types in restoration programs for historic buildings. A grant to computerize the information was received from Hunter College. Mr. Horenstein was elected president of the

New York Paleontological Society, and continued to publish his *New York City Notes On Natural History*.

Fossilized Pollen Harold L. Cousminer, Research Associate, continued his research on fossil spores, pollen and other organic-walled microfossils. He began testing a new time scale based on cyclic distribution of pollen, analyzed cyclical variations in spore assemblages from New Jersey Late Cretaceous strata, and used pollen and sediment samples to precisely correlate Staten Island (N.Y.) Cretaceous strata with the Sayreville Sand Member of the upper Raritan Formation of New Jersey.

Howard R. Feldman, Research Associate, worked on the systematics and paleoecology of Middle Devonian brachiopods from New York. In July and August, he was at the Geological Survey of Israel, collecting Jurassic brachiopods from Northern Sinai. The Maghara faunas from Sinai display a close affinity with Eurasian Tethyan shelf faunas and situated on the African continent, form a key link between the European faunas and those of Afro-Indian origin which lay south of the Tethys.

Red Sea Studies John H. Lee, Research Associate, and his collaborators conducted experiments at the Steinitz Marine Laboratory at Elat on the Red Sea to isolate symbiotic algae from several species of larger foraminifera. The symbiotic algae they isolated were diatoms including two species. This itself is very unusual, since only one other case of diatom-invertebrate endosymbiosis in the hundreds of known examples of algal-invertebrate endosymbioses has been previously described.

Linda Habas Mantel, Research Associate, prepared an extensive review on osmotic and ionic regulation for *Biology of the Crustacea*, to be published by Academic Press. As senior editor of Volume 2 of this treatise, she was responsible for eight chapters. She also studied the effects of hormones on the salt-absorbing tissues of insects and other arthropods at the University of Cambridge, England.

Leslie F. Marcus, Research Associate, continued his research on the applications of multivariate statistics in systematics, and computer studies of changes in the shape of the earth (geoid deformation) over the last 10,000 years. At a symposium of the Southern California Academy of Sciences he summarized the implications of Carbon 14 dates for the stratigraphy of the Rancho La Brea deposits. He received grants from the City University of New York to study stable carbon isotopes and diet in living and extinct animals.

Behavior of Crabs Lawrence W. Powers, Research Associate, continued his studies of the ecology, evolution and social behavior of semiterrestrial crabs. He presented a paper on the behavioral aspects of crustacea at the 1978 meeting of the American Society of Zoologists. Dr. Powers is attempting to assess the amount of individual variation of crabs within a population and the differences between populations that characterize a species.

George A. Schultz, Research Associate, continued his work on terrestrial and marine Isopoda (crustaceans) and neared completion of a study on terrestrial species from North Carolina. Dr. Schultz's investigation of Antarctic marine isopods resulted in his submitting for publication the first part of an extensive revision of the Arcturidae from the region. He also studied isopods from Bermuda.

Environmental Impact Study John D. Soule, Research Associate, analyzed heavy metals from cheilostome bryozoans. They were collected in the Los Angeles-Long Beach harbors as part of an environmental impact survey. Dr. Soule re-examined specimens described by George Busk from Magatlan, Mexico, to revise the taxonomy of the bryozoan fauna of west Mexico.

With support from the NSF, Horace W. Stunkard, Research Associate, continued his investigations of cestodes and digenetic trematodes, parasitic worms with complicated life-cycles. He conducted his experimental work at the Marine Biological Laboratory, Woods Hole, Massachusetts. Dr. Stunkard also studied and described the morphology of the successive larval stages and adult forms.

Micropaleontology Press John A. Van Couvering, Editor, and Associate Editors Norman Hillman, Martin Janal and Ruth Manoff, aided by a new offset printing press, reported a productive year for Micropaleontology Press. Volume 4 of the "Catalogue of Planktonic Foraminifera" was completed, and supplements to the "Catalogue of Foraminifera" and "Catalogue of Ostracoda," and twelve issues of the "Bibliography and Index of Micropaleontology" were published, totalling approximately 1400 pages. The Press also brought out five numbers of the journal *Micropaleontology*.

Dr. Van Couvering completed the editing of a symposium volume on catastrophes in earth history with William A. Berggren, Research Associate, to be published by Princeton University Press. He continued his work on radiometric age determination and stratigraphy at fossil mammal sites in Kenya, Southwest Africa, Israel, Iran and Java, and participated in defining the Pliocene/Pleistocene Boundary, and the consequences of the evaporation of the Mediterranean Sea at the end of the Miocene. He also participated in the revision of the American

Stratigraphic Code.

Mr. Janal collaborated with Esfir Saperson, a refugee Soviet micropaleontologist now at Woods Hole Oceanographic Institute, on the translation and publication of her lifelong study of Paleogene Foraminifera from southern Russia.

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Department of Mammalogy

Nearly a quarter-million mammal specimens are in the department's collection of Recent mammals. This makes it the second largest collection in the U.S. Collection use has increased in recent years due to its breadth of representation and to the department's reputation for prompt service regarding specimen loans, or use of specimens at the Museum. Both curation and loan services have been improved significantly recently through support from the National Science Foundation.

A scientific publication based in some way on the department's collection appears on the average of every six days, a measure of the importance and contribution of Mammalogy's resources to scientific

research. In 1978 there were 4080 specimens out on 307 loans, with loans going to institutions in 26 states and five nations. Visitors to the department included 48 scientists and 72 students from sixteen states and three foreign countries.

Raccoons Studied Sydney Anderson, Chairman and Curator, and his associates continued their long-range studies of the ecology of raccoons on St. Catherine's Island. He also began studies of the status of the loggerhead sea turtle which nests on the island's sandy outer beaches and whose nests are raided by raccoons, pigs and other species.

Dr. Anderson published a joint paper with Mary K. Evensen, graduate student at the City University of New York, on randomness in the evolution of two separate species from a single population, and continued his work on the relationship of geographic distributions and faunal diversity. He also gave an invited lecture on this topic at a symposium on the origin and maintenance of diversity held at the Field Museum of Natural History in Chicago in May.

Behavior of Giraffes Richard G. Van Gelder, Curator, investigated proposals for changes in the scientific names of domestic animals and responded to questions raised by a primatologist about the names of primates. He also continued his studies of records of hybridization among all mammals and on some of the implications of hybridization. He used field notes on the behavior and taxonomy of giraffes in Botswana to draft a manuscript, but deferred further field work in Africa while recovering from malaria contracted on an earlier visit.

Ranges of Bats Karl F. Koopman, who was promoted to Curator this year, continued his work on bats and their biogeography, presenting a phylogenetic analysis of bat teeth at the Fifth International Bat Research Conference in Texas in collaboration with Giles T. MacIntyre of Queens College. Dr. Koopman also prepared maps showing the ranges of all South American bats; co-authored notes on Guatemalan bats with Robert W. Dickerman, Department of Ornithology, and completed an analysis of bats inhabiting islands off Papua, New Guinea. An analysis of bats from the eastern part of the country is in preparation.

Southeast Asian Rodents Following up on his extensive field research, Archbold Curator Guy G. Musser worked on murid rodents from Southeast Asia to Australia, concentrating on the taxonomy and natural history of the Sulawesi rodents. His other projects included an analysis of the chromosomes of Sulawesi murids (with Shirley Chiu, Curatorial Assistant); a definition of the Asian species *Rattus sikkimensis* (with Shirley Chiu and Joe T. Marshall,

Jr., U.S. Fish and Wildlife Service); an identification of *Rattus* from the islands off Borneo (with Margot Dembo), and a description of a new species of shrew-rat, *Rhynchomys*, from Luzon (with Patricia W. Freeman, Field Museum of Natural History). Dr. Musser also worked on an analysis of altitudinal distributions and natural histories of bats from central Sulawesi with Elizabeth Plowman, volunteer assistant, and Dr. Koopman; a study of the species of *Tarsius* from Sulawesi, with Richard W. Thorington, National Museum of Natural History; reidentifications of subfossil murids from cave deposits in Southwestern Sulawesi with Margareta Becker; and an analysis of the island area and body size of *Rattus muelleri*, with Lawrence R. Heaney, University of Kansas.

Curatorial Interns The Curatorial Research Interns program, begun in 1977, continued to help young scholars to study in the collections, gain curatorial experience and improve the arrangement and usefulness of the collections themselves. Intern Lisa Shorr from the City University of New York worked on primates, and Mary Evensen from CUNY worked on rodents. Janet Sherman, University of Chicago, and Virginia Naples, University of Massachusetts, worked on edentates. Douglas Pengilly, University of Alaska, and Karen Anderson, a University of Connecticut intern, worked on canids.

The department also relies heavily on the contributions of volunteers, who help out with a wide variety of tasks. Tom Cheu, Joshua DeLeon, Elaine Dimaculangon, Mary Evensen, Amy Greenfield, Jesse Hochstadt, Elizabeth Plowman, Elissa Quiñones, Russell Robbins, Margot Dembo, and Donna Simmons were among the outstanding volunteers this year.

The renovation of 4000 square feet of space on the third floor, in an area recently vacated by Mineral Sciences, provided storage for the pigs and pecaries and freed up the space they had previously occupied.

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Department of Mineral Sciences

Minerals are records that give us an insight into the history of the earth and the processes which formed it. Members of the department study both the nature and origin of minerals, rocks and meteorites. The department also maintains an active specimen loan program, and has made important contributions to recent exhibitions such as the popular Volcano!

The collections are the department's core and its great treasure for future generations. Research and other uses of the collections are carried out by staff members, associates and people throughout the world. Great effort is spent on increasing the quality and breadth of the collections, a never-ending, time-consuming task.

New Collections Area The collections were moved during the summer into the newly-constructed collections area. Long hours of reorganization followed, carried out mainly by James Ferraiolo under the auspices of the New York State Council on the Arts, and Jeffrey Ravodowitz under the auspices of the Federal CETA program. This important project, which was coordinated by staff members,

was greatly aided by volunteers.

This year, nearly 1000 new mineral and gem specimens were acquired. More than half were gifts, valued at nearly \$300,000; most of the rest were acquired through trade and purchase. Progress was also made in starting a micromount collection of minerals. This collection consists of minerals in crystal forms smaller than the naked eye can see.

Specimens were also loaned to many individuals and institutions, including the Metropolitan Museum of Art (for the Dresden exhibition), the Hall of Science, Flushing, N.Y., the San Diego County Museum, and the Roberson Center for Arts and Sciences, Binghamton, N.Y. In addition, specimens appeared in the Museum's temporary exhibitions "Ice Age Art" and *Volcano!*, as well as in a Rare Book Room display. Several were also exhibited at the Tucson, Detroit, Seton Hall, and Rochester mineral and gem shows.

A major effort was made to increase the photographic collection of minerals and gems. There are now over 400 high-quality slides of minerals, gems, meteorites, and miscellaneous illustrations related to the collections.

Volcano! The department played a major role in the creation of *Volcano!* A companion to *POMPEII AD79*, *Volcano!* employed a variety of multi-media techniques, including films of volcanic eruptions, to describe the nature of volcanism around the world. Martin Prinz, Chairman and Curator, was responsible for the scientific conception of the exhibition.

Educational Efforts Dr. Prinz was a faculty member on a three-week Museum Discovery Tour cruise to the Aegean in the fall. He also taught at a gifted children's program at Fordham University in Lincoln Center. George E. Harlow, Assistant Curator, taught a course on rocks and minerals twice a year for the Museum's adult evening program, and also led an annual two-day field trip to Pennsylvania and New Jersey. Dr. Harlow and Joseph J. Peters, Scientific Assistant, gave numerous talks to mineral and gem clubs and shows, and Mr. Peters was elected president of the New York Mineralogical Club, the oldest in the U.S. Mr. Peters and Joseph Rothstein, Associate, also did a great deal of educational work, answering questions from the public and identifying specimens.

Research Programs The meteorite research program, funded by NASA, absorbs a large proportion of research time. Research on minerals and gems and study of deep-seated rocks are planned as major programs. During the next two years, an in-depth inventory of the entire mineral collection will be carried out. Unusual minerals will be X-rayed and studied with the electron microprobe, and new minerals

or unusual varieties of minerals will be researched. The programs outlined below are only a part of the present overall activities in these areas.

Achondritic Meteorites The new field of comparative planetology investigates how planetary bodies are formed and how they function. Clues to their origins and the nature of their interiors are often to be found in achondritic meteorites, which form inside or on the surface of small planets.

Numerous achondritic meteorite projects were carried out this year, including one on a group called aubrites, which was studied by Thomas R. Watters, a graduate student at Bryn Mawr University, and Dr. Prinz. Aubrites are the most reduced (least oxidized) achondrites known and have practically no iron. The entire known group of 10 meteorites was intensively studied, and a model of the planet of their origin, one of unusual composition, was developed.

Another achondrite group, ureilites, was studied by John L. Berkley, G. Jeffrey Taylor and Klaus Keil, all of the University of New Mexico, with Drs. Harlow and Prinz. Ureilites contain deep-seated silicate minerals surrounded by a carbon matrix which includes small, rare diamonds. Eight meteorites were studied and a model for their origin was created. Another group of three rare meteorites called nakhlites, which are nearly indistinguishable from earth rocks, was studied. They are only 1.3 billion years old, compared to 4.5 billion for most meteorites. The results of these studies and others were presented at the Tenth Annual Lunar and Planetary Science Conference in Houston, Texas, in March.

Stony Irons and Irons Mesosiderites, a complex group of stony-iron meteorites, are being studied on a longer range basis. The stony parts are similar to several groups of achondrites mixed together; the iron parts are similar to iron meteorites. Jonathan W. Snellenburg, Postdoctoral Fellow, in cooperation with other departmental members, used unique mineral assemblages and gathered thermodynamic data necessary to help understand the conditions that produced them.

A related project concerned large olivine crystals, and their coronas, found in all mesosiderites. It was led by C. E. Nehru, Research Associate, with departmental members.

Weekeroo Station, a rare iron meteorite which contains small silicate inclusions of unknown origin, was studied by Drs. Harlow and Prinz, and Robert Klimentidis, Technical Specialist, in collaboration with R. K. O'Nions, Research Associate, and his associates at the Lamont-Doherty Geological Observatory of Columbia University.

Medical Research It is well known that certain minerals ingested into the body, especially fibrous ones such as asbestos, can cause disease, for example, cancer. Less generally known minerals also appear to cause serious medical problems. The interaction between minerals and medicine will be investigated in a project led by Dr. Harlow. As a first step in this study, Dr. Harlow and Mr. Klimentidis are studying the anthophyllite mineral group, which has fibrous minerals. They are making use of the department's electron microprobe and X-ray cameras.

Gold Dr. Harlow began a study of the morphology of gold by examining specimens at high magnifications with the interdepartmental scanning electron microscope (SEM). This particular study is especially appropriate given the strong focus on gold at the Museum with the opening of "Gold of El Dorado" in November. Dr. Harlow will present a related exhibition on the chemistry, distribution, recovery and uses of gold which will include a display of SEM photographs.

Other Mineral Studies A number of other mineral studies are also under way. Dr. Harlow is studying the mineralogy of skarn deposits (minerals generally formed in limestones that have been intruded by a hot igneous body), especially that of Limecrest, N.J. He is concentrating on the mineral scapolite and its decomposition into muscovite and uranbetafite. With Abraham Rosenzweig of the University of South Florida, he is studying what is believed to be a new mineral from Korea, a silver-lead-bismuth-sulfide. Joseph Peters and Thomas A. Peters, Associate, are studying the crystal cavities of the first Watchung Mountains of New Jersey. Mr. Rothstein continued his field studies and work on a book on gems. Julius Weber, Associate, continued his mineral photography projects and produced many photographs for the new Audubon Guide to Minerals and Rocks.

Exhibitions Dr. Prinz was involved in preparations for the new Arthur Ross Hall of Meteorites. In addition to Dr. Harlow's gold exhibit for November, there will be a small exhibit of American gemstones by the American Gem Society in the Hall of Meteorites, Minerals and Gems.

Arthur Langer of Mt. Sinai School of Medicine and Dr. O'Nions of Columbia University were appointed Research Associates.

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Mineralogy and petrology of the Chervony Kut eucrite. *Lunar and Planetary Science X*, Houston, Texas, pp. 446-448.

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Keil, Klaus

See Berkley, Keil, Prinz and Gomes and Floran, Prinz, Hlava, Keil, Nehru and Hinthorne and Gooding, Prinz and Keil and Harlow, Nehru, Prinz, Taylor and Keil above

Klimentidis, Robert

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Martin Prinz

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Olivine coronas in mesosiderites: Implications and petrogenesis. *Lunar and Planetary Science X*, Houston, Texas, pp. 904-905.

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O'Nions, R. K.

See Evenson, Hamilton, Harlow, Klimentidis, O'Nions and Prinz above

Peters, Joseph J.

See Prinz, Harlow and Peters below

Prinz, Martin

1979.

[Review of] Mineralogy of the Diamond, by Yu. L. Orlov. *EOS, Transactions American Geophysical Union*, vol. 60, p. 4.

Prinz, Martin, George E. Harlow, Joseph J. Peters, eds. 1978.

Rocks and Minerals. Simon and Schuster, New York, 607 pp.

See also Berkley, Keil, Prinz and Gomes and Evensen, Hamilton, Harlow, Klimentidis, O'Nions and Prinz and Floran, Caulfield, Harlow and Prinz and Floran, Prinz, Hlava, Keil, Nehru and Hinthorne and Gooding, Prinz and Keil and Harlow, Nehru, Prinz, Taylor and Keil and Nehru, Snellenburg, Zucker and Prinz above and Snellenburg, Nehru, Caulfield, Zucker and Prinz and Watters and Prinz below

Snellenburg, J. W., C. E. Nehru, J. B. D. Caulfield, S. Zucker and Martin Prinz 1979.

Petrology of temperature and oxygen fugacity indicating mineral assemblages in four low-grade mesosiderites. *Lunar and Planetary Science X*, Houston, Texas, pp. 1137-1139.

See also Nehru, Snellenburg, Zucker and Prinz above

Watters, T. R. and Martin Prinz

1979.

Aubrites: Their origin and relationship to Echondrites. *Lunar and Planetary Science X*, Houston, Texas, pp. 1319-1321.

Abstracts and Popular Publications:

Prinz, Martin

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Fiery Vesuvius. *Natural History*, vol. 88, no. 4, pp. 41-48.

Department of Ornithology

This department has a distinguished history of research and education in the evolution, systematics and biogeography of the birds of the world. Its collections number nearly one million specimens and are rivaled in size only by those of the British Museum. They include ninety-eight percent of all the world's species of birds.

The department's bird collection continued to grow in importance to the scientific community last year. Several thousand specimens were loaned to research investigators; in addition, several hundred visitors were given access to the collection. This increased use has been made possible by a seven-year program to improve availability, supported by the National Science Foundation.

Rare Flycatcher Studied Wesley E. Lanyon, Chairman and Lamont Curator of Birds, continued his research on the systematics and evolution of tyrannid flycatchers, completing his revision of the largest genus, *Myiarchus*, and turning his attention to its closest relatives. His field work concentrated on the Flammulated Flycatcher (genus *Delta-rhynchus*) of the west coast of Mexico, a bird rarely seen by ornithologists. With the cooperation of Miguel Alvarez del Toro, Natural History Institute, Chiapas, Dr. Lanyon located several pairs, tape recorded their calls and found the first known nest. The Flammulated Flycatcher is a cavity nester, with eggs indistinguishable from those of *Myiarchus*. Tissue samples have been sent to Yale University for genetic analysis, which may provide additional clues to the species' systematic position.

Field Studies in Kenya Curator Lester L. Short's book on woodpeckers of the world (Picidae) is set for publication in March. He and Jennifer Horne continued their field studies in Kenya on barbets (Capitonidae), close relatives of woodpeckers, and on barbet-honeyguide interactions. More than 30 reels of tape—mainly of barbet vocalizations—which they recorded in Kenya will be analyzed to gain an understanding of barbet relationships and vocal displays.

For the fourth consecutive year, Dr. Short participated in the Museum Discovery Tour cruise of the Egyptian Nile. As a result of the trip, he prepared a report in collaboration with Jennifer Horne on recent changes in winter bird distribution in Egypt. His other projects included ongoing studies of the South American caatinga, or scrub habitat, and the

Australian rosella parrot.

Andean Birds François Vuilleumier's work on the distribution, zoogeography, and speciation of Andean birds resulted in a joint paper with Daniel Simberloff of the University of Florida (Tallahassee) entitled "Ecology versus History as Determinants of Patchy and Insular Distribution in High Andean Birds." In it, the distribution of 147 bird species are analyzed as a means of measuring competition, habitat patchiness, Pleistocene history, and chance in shaping distribution patterns.

Dr. Vuilleumier, who was promoted to Curator on July 1, continued his work on a review paper concerning biochemical criteria in systematics, working with Christian Frelin of the University of Dijon. A general paper is now in press, and work on the main review article has been modified in order to take into account the latest developments in molecular genetics.

Dean Amadon, Lamont Curator Emeritus, pursued numerous writing projects and also did field work at the Archbold Biological Station. Research Associate Walter Bock studied tongue morphology in Old World nectar-feeding passerine birds, the cranial morphology of *Atrichornis*, and the jaw and tongue apparatus of passerine birds based on *Corvus*. He collaborated with Dominique Homberger on studying functional morphology in the feeding apparatus of parrots. Research Associate Jared M. Diamond, who was elected a member of the National Academy of Sciences in the spring, collaborated with Mary LeCroy, Scientific Assistant, on an analysis of birds of the Karkar and Bagabag Islands off the north coast of New Guinea. He also continued his studies with Ernst Mayr, Curator Emeritus, on speciation and colonization in northern Melanesian birds.

Mary LeCroy conducted field work in Papua New Guinea on Goldie's Bird of Paradise (*Paradisaea decora*). Research Associate Robert W. Dickerman spent half the year at the Australian National Museum in Canberra City on an NIH Fellowship Award. He and Research Associate William Phelps, Jr., worked on specimens collected last year in the first ornithological survey of Cerro Urutani, along the Venezuelan-Brazilian border. Eugene Eisenmann, Research Associate, worked on a revised American Ornithologists' Union Checklist of North American Birds. Research Associate James C. Greenway, Jr., continued his work on a catalog of department type specimens. Research Associate G. Stuart Keith pursued his studies of birds of the Malagasy Region.

Chapman Fund Awards \$40,000 The Frank M. Chapman Memorial Fund—the single most important source of financial support for ornithological research in the world—made 89 awards totalling

\$40,000. In addition, the committee awarded an Elsie Binger Naumburg fellowship to Robert C. Eckhardt of the University of Maine.

An exhibit on hummingbird flight in the Gallery 3 Annex used photographs by Carlton Keppelman and drawings from the book *Hummingbirds* by Research Associate Crawford H. Greenewalt.

The work of the department was greatly aided by associates and volunteers, including Ruth Trimble Chapin and Lowrie S. Flagg, Marianna Neighbour, Ruth DeLynn, Henry Pelzl, Sharon Rose, Blanche Hardtke and Eladio Romero.

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1978. The Tasmanians: the longest isolation, the simplest technology. *Nature*, vol. 73, pp. 185-186.

Diamond, Jared M. and M. N. Raga

1978. Mottled-breasted Pitohui, *Pitohui incertus*. *Emu*, vol. 78, pp. 49-53.

Frelin, C. and François Vuilleumier

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Short, Lester L.

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1978. Birds of the fall, 1978, American Museum of Natural History Mediterranean Cruise. Printed report, 15 pp.
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Department of Vertebrate Paleontology

Studying the evolution of life from the perspective of the so-called higher animals known as vertebrates is the primary activity of this department. Concentrating on the history of the fossil members of this group, Vertebrate Paleontology relies on collections which are among the Museum's finest. These are also used by research scholars from around the world and have served as the source for numerous popular Museum exhibitions on prehistoric animals.

Chairman and Curator Richard H. Tedford's research continued on the phylogeny and classification of the

Marsupialia and Carnivora, and on the biochronology of the late Tertiary mammalian faunas of North America. His marsupial studies included work on fossil Diprotodonta, on Miocene ring-tail possums, and on the Oligocene marsupial fauna from Tasmania.

With R. T. Wells of Flinders University, South Australia, Dr. Tedford also began descriptions of skeletons of two species of sthenurine kangaroos obtained during his field studies at Lake Callabonna, South Australia.

Dr. Tedford and Theodore Galusha*, Frick Curator Emeritus, jointly conducted stratigraphic studies in western Nebraska and Arizona. With Robert J. Emry, Research Associate, Dr. Tedford pursued the same work in North Dakota. He also continued his work on the Canidae with Beryl E. Taylor, Frick Associate Curator.

Permian Shark Studies Bobb Schaeffer, Curator Emeritus, continued his work on the braincase of the Permian shark, *Xenacanthus*, as part of a broader effort to analyze neurocranial characteristics in the elasmobranchs, placoderms and telostomes. He also worked on a description and taxonomic evaluation of Jurassic fishes from the Sundance and Todilto formations of the western United States, in collaboration with Colin Patterson, Department of Ichthyology.

Malcolm C. McKenna, Frick Curator, continued his classification of Mammalia with the cooperation of Susan Koelle Bell, Scientific Assistant, Dr. Tedford, and Karl F. Koopman and Guy G. Musser, Department of Mammalogy. Reclassifications of Cetacea, Artiodactyla, Trigonostylopoidea, Notoungulata and Astrapotheria were emphasized and plans were developed to computerize the classifications. Dr. McKenna also continued his study of the skull of the insectivore *Pararyctes*, a small, early, carnivorous mammal. As part of a cladistic analysis of amino acid sequence data undertaken with researchers from the Netherlands and Wayne State University, Dr. McKenna collected pikas from the Rocky Mountains.

Arctic Studies During the summer, Dr. McKenna led a month-long expedition to Disko Island in western Greenland to study Paleocene and Cretaceous deposits. No specimens of fossil vertebrates were found. Research he did on Ellesmere Island's Eocene mammals led to a study of the possible bearing of Eocene climatic information on the earth's spin-axis orientation. He presented his preliminary findings at a symposium sponsored by the Society of Vertebrate Paleontology and the Geology Society of America.

Argentine Expedition Dr. McKenna also participated in a month-long expedition to Argentine Pata-

gonia with colleagues from the Field Museum. The group found new Paleocene fossil vertebrate localities. In addition, he accompanied Jerome G. Rozen, Jr., Deputy Director, and Harold Cousminer, Micropaleontology, to Wyoming to collect Eocene bees nests.

Mr. Taylor pursued his research with David S. Webb, University of Florida, on the interrelationships of the lower ruminants. They also completed a final draft of a manuscript of *Archaeomeryx*, a primitive hoofed animal. Mr. Taylor concluded generic revisions of the protolabidine camels with James G. Honey, U.S. Geological Survey.

Fossil Turtle Specimens Eugene S. Gaffney, Associate Curator, prospected for turtle remains in the Jurassic formations of Colorado and Wyoming. As a result of his visit to the University of Wyoming in Laramie, supported by an Explorers Club grant, he produced a paper on an Eocene turtle. His work on Australian turtles continued with completion of papers on fossil chelids and trionychids.

Elizabeth Oswald, Scientific Assistant, and Dr. Gaffney cooperated on a project concerning the dermatemydid turtles *Adocs* (Cretaceous) and *Baptemys* (Eocene). A January study trip to the National Museum of Natural History in Washington, D.C., involved work on *Baptemys* and other dermatemydids. In March and April, Dr. Gaffney went to Europe to study Triassic turtles, and to participate in a symposium on tetrapod evolution in Newcastle, U.K.

John G. Maisey, who joined the department in May as Assistant Curator, focused on the morphology of the fin spines in certain sharks. He is also pursuing studies on the evolution of the sharks. Curator Emeritus Edwin H. Colbert continued his work on Triassic vertebrates from Antarctica, and did studies on Triassic reptiles from New Jersey. He also worked on the third edition of his book, "Evolution of the Vertebrates," and on his analysis of the distribution of tetrapods with relation to plate tectonics.

Mr. Galusha did field work in Nebraska, New Mexico and Arizona, and participated in an international symposium in Santa Fe dealing with the tectonics and magmatism of the Rio Grande rift. "Concession to the Improbable," the autobiography of George Gaylord Simpson, Curator Emeritus, was published. Dr. Simpson also continued his writings on fossil penguins, South American mammals, Mesozoic mammals and methods in historical biology.

Frick Curator Emeritus Morris F. Skinner was awarded a Doctorate of Science degree by the University of Nebraska in recognition of his contributions to the geology and paleontology of the state. Assisted by F. Walker Johnson, volunteer, he continued his review of the Neogene stratigraphy and biostratigraphy along the Snake and Niobrara Rivers.

Dr. Skinner and Bruce J. MacFadden, University of Florida, completed a study of the Neotropical fossil horses *Onohippidium* and *Hippidion*.

Donald Baird, Research Associate, continued his research on fossil reptiles and amphibians of the eastern United States and Canada; the work is supported by the W. B. Scott Research Fund of Princeton University.

Primate Evolution Eric Delson, Research Associate, awaited publication of his handbook/monograph "Evolutionary History of the Primates." The work was written with Frederick S. Szalay, Research Associate. A summary of the book's major conclusions is being prepared with Alfred Rosenberger, State University of New York, Stony Brook. Drs. Delson and Rosenberger also did research on the Pliocene and Early Pleistocene Old World monkeys of Africa. Their work is funded by the Faculty Research Program, City University of New York, and the National Science Foundation.

Robert J. Emry continued his studies of Eocene and Oligocene mammals, funded by the Smithsonian Institution. Max K. Hecht, Research Associate, pursued a critical evaluation of *Archaeopteryx*, and continued his work on Jurassic lizards; both projects are supported by a CUNY Faculty Research Grant.

Field studies in Nebraska and Wyoming, and continued work on the systematics of the bear-like amphicyonid carnivores, were carried out by Research Associate Robert M. Hunt, Jr. Work on dinosaur systematics, and on the origin of flight in birds, occupied John H. Ostrom, Research Associate. As a means of tracing major evolutionary steps, Leonard B. Radinsky, Research Associate, continued his studies of the endocasts of braincases in fossil carnivores and ungulates.

Dr. Szalay was awarded a Guggenheim Fellowship to conduct research on the functional anatomy of the limbs of marsupials in South America and Australia. Associate John H. Wahlert continued his NSF-supported research on the relationships of florentiamyine (gopher-like) rodents.

New Specimens Added The department received a three-year NSF grant to renovate and curate the fossil reptile and amphibian collection, which is under the supervision of Dr. Gaffney.

The collections grew with the addition of about 50 Eocene vertebrate specimens. Fifty Cretaceous mammal teeth were received from Gerald Case, and nearly 50 Paleocene and Eocene specimens from Argentina were borrowed to prepare plastic duplicates. One hundred twenty-four Miocene and Pliocene mammal specimens came from Messrs. Galusha, Skinner, and Dr. Tedford. C. H. Marks contributed five slabs of Connecticut Valley sandstone containing reptilian tracks. Five hundred and twenty

casts of fossil mammals were received in exchanges with other institutions. The fossil mammal collection now supports research by nearly 100 investigators. Approximately 30 investigators are using the fossil amphibian, reptile and bird collections.

*deceased.

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1979.

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Baird, Donald and *David W. Krause*

1979.

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1978.

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1978.

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1978.

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See Hawley and Galusha below

Hawley, J. W. and Theodore Galusha

1978.

Bernalillo to south of San Ysidro. In *Guidebook to Rio Grande rift in New Mexico and Colorado*. New Mexico Bureau of Mines and Mineral

Resources Circ. 163, pp. 177-182.

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1978.

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1978.

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1978.

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Luckett, W. P., and Frederick S. Szalay
1978.

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MacFadden, Bruce J., and Morris F. Skinner
1979.

Diversification and biogeography of the one-toed horses, Onohippidium and Hippidion. Postilla, no. 175, pp. 1-10.

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1978.

Growth and form of finspines in hybodont sharks. Palaeont., vol. 21, pp. 657-666.

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Preservation and prefossilisation of fossil finspines. Neues Jahrb. Geol. and Palaeont., no. 10, pp. 595-599.

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1979.

Calibration of the Great American Interchange. Science, vol. 204, pp. 272-279.

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1978.

Mammalian faunal dynamics of the Great American Interchange: an alternative interpretation. Paleobiol., vol. 4, pp. 203-206.

McKenna, Malcolm C.
1979.

[Reviews of] Molecular anthropology: Genes and proteins in the evolutionary ascent of the primates, Goodman, M. and R. E. Tashian,

eds.; On the evolution of myoglobin, Romero-Herrera, A. E., K. A. Joysey, and A. E. Friday, eds., Syst. Zool., vol. 28, pp. 109-113.

Ostrom, John H.
1978.

Leptoceratops gracilis from the "Lance" Formation of Wyoming. Jour. Paleont., vol. 52, pp. 697-704.

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See also Platnick and Gaffney, Dept. of Entomology

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The evolutionary history of dog brains. Museologia, no. 10, pp. 25-29.

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1978.

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1978.

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A new genus of late Tertiary penguin from Langebaanweg, South Africa. *Ann. South African Mus.*, vol. 78, pp. 1-9.
- Skinner, Morris F.
See MacFadden and Skinner above
- Szalay, Frederick S.
See Luckett and Szalay above
- Taylor, Beryl E.
See Honey and Taylor above
- Tedford, Richard H.
See Marshall, Butler, Drake, Curtis and Tedford and Rich, Archer, and Tedford above

Abstracts and Popular Publications:

- Baird, Donald
1978.
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1978.
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- Delson, Eric
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1978.
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1979.
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Oreopithecus is a cercopithecoid after all. *Amer. Jour. Phys. Anthrop.*, vol. 50, pp. 431-432.
- Gaffney, Eugene S.
1979.
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- Ostrom, John H.
1978.
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- Simpson, George Gaylord
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1978.
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Footnote to the discussion of Rosa's theories by Baroni-Urbani. *Syst. Zool.*, vol. 27, p. 346.
1978.
Paleontology: It can be a fun science. *Sci. Digest*, December, pp. 54-57.
- Szalay, Frederick S.
1979.
The problems of adaptation among Paleogene primates. Abstracts of the VIIIth Internatl. Primatological Soc., Bangalore, India.
- Tedford, Richard H.
1978.
History of dogs and cats, a view from the fossil record. Ralston Purina Company, 10 pp.

Archbold Biological Station

The Archbold Biological Station, established in 1941 and supported through the Museum by Archbold Expeditions, Inc., is situated on the Lake Wales Ridge in southcentral Florida. Located in one of the most distinctive biological regions of the state, it has well-equipped laboratories, an excellent library, reference collections, a dark-room, animal rooms, a greenhouse, outdoor cages and shops. It also has housing and dining facilities for visiting investigators and groups.

The station is one of the most important natural

reserves in southern Florida. It has a number of plants and animals on rare and endangered species lists, and many of these are being actively studied. It also provides environmental information for state and county land-use decisions. The station staff frequently serves on advisory committees or as consultants to state agencies. Staff members also contribute to public education on such topics as endangered species, wildlife and natural environments, land-use planning, and water quality.

Staff Activities In a continuing study, Resident Director James N. Layne compiled information on exotic mammals and their impact on native biota, and presented a summary at a conference held at Florida Atlantic University. He also conducted field work on small mammals in two study areas in northern peninsular Florida that he has investigated over a 22-year period. Information from this work has played a significant role in Florida's decision to acquire the lands as natural preserves.

Dr. Layne also began an analysis of data he collected from 1974-78 on the distribution and population of the Crested Caracara in Florida. In connection with the station's interest in acquiring Lake Annie he surveyed the vegetation of the 150-acre area surrounding the lake. Dr. Layne was awarded a National Science Foundation grant to attend the Second International Theriological Congress in Brno, Czechoslovakia, where he presented a paper with Deborah Glover, student assistant, on activity cycles in armadillos inhabiting the station. He served with the Florida Panther Recovery Team and chaired a panel at the April Conference on Florida Exotic and Nonnative Species.

Chester E. Winegarner, Scientific Assistant, continued his study of reproductive biology and behavior of the Great Crested Flycatcher, weighing and measuring young that were about to fledge. He participated in several vertebrate censuses in Florida State Preserves and took part in the Christmas Bird Count at the Fakahatchee State Preserve. Mr. Winegarner was also a member of the Sooty and Noddy tern banding expedition to the Dry Tortugas.

Fred E. Lohrer, Scientific Assistant, conducted visual and track censuses of gray squirrels, armadillos and other mammals, and assisted in roadside counts of birds-of-prey and wading birds. He edited the Florida Ornithological Society's *Florida Field Naturalist*, and was Treasurer of the Environmental Council of Highlands County.

Effects of Fire Warren Abrahamson, Research Associate, continued to study the effects of fire on natural vegetation patterns. He monitored changes in plant species density, frequency, diversity, dominance and growth rates, and in soil nutrient levels

before and after burning on sites established in 1977. The results are providing information needed to develop a fire management plan for station habitats.

Research Associate Glen E. Woolfenden, with support from a Chapman Fellowship, continued his investigation of the sociobiology and ecology of Florida Scrub Jays. In addition to taking monthly censuses, mapping territories, and locating and recording the complete histories of all nests during the breeding season, he surveyed dispersal patterns and population density in a 1000-acre study tract. With John Fitzpatrick of the Field Museum of Natural History, he began analyzing ten years of data for a report on Scrub Jay demography, with emphasis on density, habitat selection, dispersal, pair bonding, breeding success, and survival. Their work is supported by a joint grant from the National Geographic Society.

Dr. Woolfenden received the Ernest P. Edwards Prize from the Wilson Ornithological Society for the best paper appearing in the *Wilson Bulletin* in 1978; the paper was based on research at the station. Research Associate Austin L. Rand and his wife continued to write their weekly column, "Nature Notes," for the *Lake Placid Journal*.

Sam P. Vander Kloet, who held an Archbold Research Fellowship, prepared an annotated checklist of native and established vascular plants. The list, including about 470 species, was based on herbarium records and extensive collection. Dr. Vander Kloet also continued his study of the taxonomy, life cycles, phenology, and environmental relationships of three species of blueberries (*Vaccinium corymbosum*, *V. darrowii*, and *V. myrsinites*) occurring at the station. One of his objectives is to determine the mechanisms that prevent *V. darrowii* and *V. corymbosum*, which hybridize successfully in the laboratory, from interbreeding in nature.

Among the research projects of students working at the station during the year was the continuation of doctoral research by William Conner of Cornell University on the role of pheromones in the courtship of the moth, *Utetheisa inornatrix*; master's thesis research on the ecology of bobcats by Del D. Guenther, University of South Florida; and a study of territorial behavior and vocalizations of mockingbirds by Sylvia Halkin, Harvard University.

Visitors Twenty-six visiting investigators and fifteen associates or assistants representing 24 institutions or agencies used the station. Thirty-seven groups totaling 778 individuals also visited, a substantial increase over the previous year. Three hundred and forty-four individuals also visited, and six publications based on research at the station appeared.

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1978.

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*Douglass, J. F. (Sponsor: James N. Layne)

1978.

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1978.

Activity and thermoregulation of the gopher tortoise (*Gopherus polyphemus*) in southern Florida. *Herpetologica*, vol. 34, pp. 359-374.

Esher, R. J., J. L. Wolfe, and James N. Layne

1978.

Swimming behavior of rice rats (*Oryzomys palustris*) and cotton rats (*Sigmodon hispidus*). *Jour. Mammal.*, vol. 59, pp. 551-558.

Fitzpatrick, J.W., and Glen E. Woolfenden

1978.

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1978.

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1978.

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1978.

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1978.

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1978.

Florida red wolf. *In* Layne, James N., ed., *op. cit.*, vol. 1, Mammals. Univ. of Presses of Florida, Gainesville, pp. 48-49.

1978.

Audubon's Caracara. *In* Kale, H. W., II, ed., *Rare and endangered biota of Florida: vol. 2, Birds*. Univ. Presses of Florida, Gainesville, pp. 34-36.

See also Douglass and Layne and Esher, Wolfe and Layne above

*Masters, W. M. (Sponsor: Thomas Eisner)

1978.

Irradiance modulation used to examine sound-radiating cuticular motion in insects. *Science*, vol. 203, pp. 57-60.

*Moskovits, Debra (Sponsor: James N. Layne)

1978.

Winter territorial and foraging behavior of red-headed woodpeckers in Florida. *Wilson Bull.*, vol. 90, pp. 521-535.

Rowley, I., S. T. Emlen, A. J. Gaston,

and Glen E. Woolfenden

1979.

A definition of "group". *Ibis*, vol. 121, p. 231.

*Rutowski, Ronald L. (Sponsor: Thomas Eisner)

1978.

The courtship behaviour of the small sulphur butterfly *Eurema lisa* (Lepidoptera: Pieridae). *Anim. Behav.*, vol. 26, pp. 892-903.

Stallcup, J. A., and Glen E. Woolfenden

1978.

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Stallcup and Woolfenden above

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1979.

[Review of] Guide to the study of animal populations, by James T. Tanner, Amer. Scientist, vol. 67, pp. 106-107.

Layne, James N., and D. Glover
1978.

Activity cycles of the nine-banded armadillo (*Dasypus novemcinctus*) in southern Florida. Second Internatl. Theriological Congr., Brno, Czechoslovakia, p. 140.

Lohrer, Fred E.
1978.

[Review of] Watching birds: An introduction to ornithology, by Roger F. Pasquier. Fla. Field Nat., vol. 6, p. 52.

Woolfenden, Glen E., and J. W. Fitzpatrick
1978.

Author's reply. Bioscience, vol. 28, p. 752.

Great Gull Island

Great Gull Island, lying off Orient Point, L.I., provides a unique setting for studying the terns that nest there.

Using the seventeen observation towers built on Great Gull Island in the fall of 1977, the nesting concentrations of Common Terns were closely studied. The nests in six sections were mapped in the spring and mapping will continue next spring. The pairs occupying the sites will be compared from year to year.

A pilot cooperative banding project was initiated on Falkners Island with Fred Sibley and Jeff Spendlow of Yale University. The project is designed to investigate the amount of exchange among the terns of the Falkners Island colony, the Great Gull Island colony and other colonies along the Connecticut shore.

Malcolm Coulter, a Chapman Fellow in the Department of Ornithology, began a two-season study of the behavior of pairs of Common Terns to determine what makes some birds more adaptive than others.

Michael Male's film *Ternwatch*, a documentary on the scientific work done on the island, was shown

23 times during the year by Helen Hays, Chairwoman of the Great Gull Island Committee, to enthusiastic audiences. The film was also rented and shown by a number of outside organizations.

Scientific Publications:

DiCostanzo, Joseph (Sponsor: Helen Hays)
1978.

Occurrences of the Common Tern in the interior of South America. Bird-banding, vol. 49, no. 3, pp. 48-51.

1978.

Great Gull Island: Migrants banded in 1978. Linnaean Newsletter, vol. 32, no. 6.

DiCostanzo, Joseph, Richard Edes Harrison and John O. Biderman (Sponsor: Helen Hays)
1978.

Photographs of New York State Rarities 28: Townsend's Warbler. Kingbird, vol. 28, no. 3, pp. 150-151.

Kalbfleisch Field Research Station

The Museum is in the process of phasing out work at the station, having decided that Museum resources might be better used elsewhere. A sales agreement with a developer has been signed, but herpetological and ornithological research at the station is expected to continue through the fall.

During the past year, the station was the site of work by two curators. Wesley E. Lanyon, Department of Ornithology, began analyzing 20 years of data on the responses of breeding birds to the succession of plant communities that characterize abandoned Long Island farmland. The results will be submitted for publication to the Museum's *Bulletin*. Dr. Lanyon also continued his experimental studies on hybridization in a captive population of Black-capped and Carolina Chickadees (*Parus atricapillus* and *P. carolinensis*). His emphasis is on the inheritance of plumage and vocal characters, and on the viability and fertility of the hybrids.

Richard G. Zweifel, Department of Herpetology, is terminating his long-term studies on the growth patterns, movements, and survival of the painted turtle, *Chrysemys picta*, garter snake, *Thamnophis*

sirtalis, and milk snake, *Lampropeltis triangulum*. Hundreds of these animals had been marked and released since the beginning of the study in 1963.

Andrew M. Greller, a visiting botanist from Queens College, completed his experiment on the flora and vegetation of a plowed field. Soil texture was demonstrated to have a strong influence on plant cover.

Colleagues and friends were saddened to learn of the death of Jack McCormick, who for many years supervised vegetation studies at the station. James Mansky completed his third year as Resident Superintendent.

Scientific Publications:

Greller, Andrew M., Robert E. Calhoon and James M. Mansky
1978.

Grace Forest, a mixed mesophytic stand on Long Island. New York Botanical Gazette, vol. 139, pp. 482-489.

Lanyon, Wesley E.

See Dept. of Ornithology, above

*Powell, George V.N. and H. Lee Jones (Sponsor: Wesley E. Lanyon)
1978.

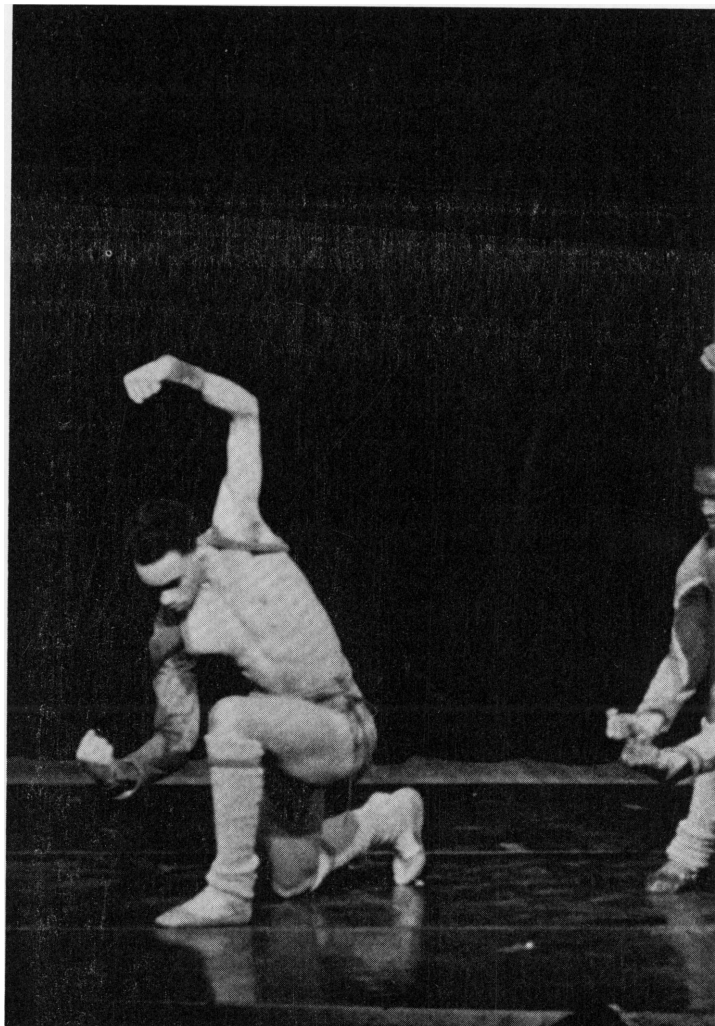
Polygyny in the Common Yellowthroat. Wilson Bull., vol. 90, pp. 656-657.

Southwestern Research Station

Despite extreme weather conditions this year, the Southwestern Research Station at Portal, Arizona, continued to provide field laboratory and research facilities for both staff and visiting scientists and naturalists from around the world. Operating since the 1950's, the station offers scientists and groups the chance for field work under controlled conditions in a natural habitat ranging from desert to mountains almost 10,000 feet above sea level.

During the year, representatives from 65 institutions used the station for scientific research on topics ranging from the ecology of wasps to the effects of underground rock formations on the soil.

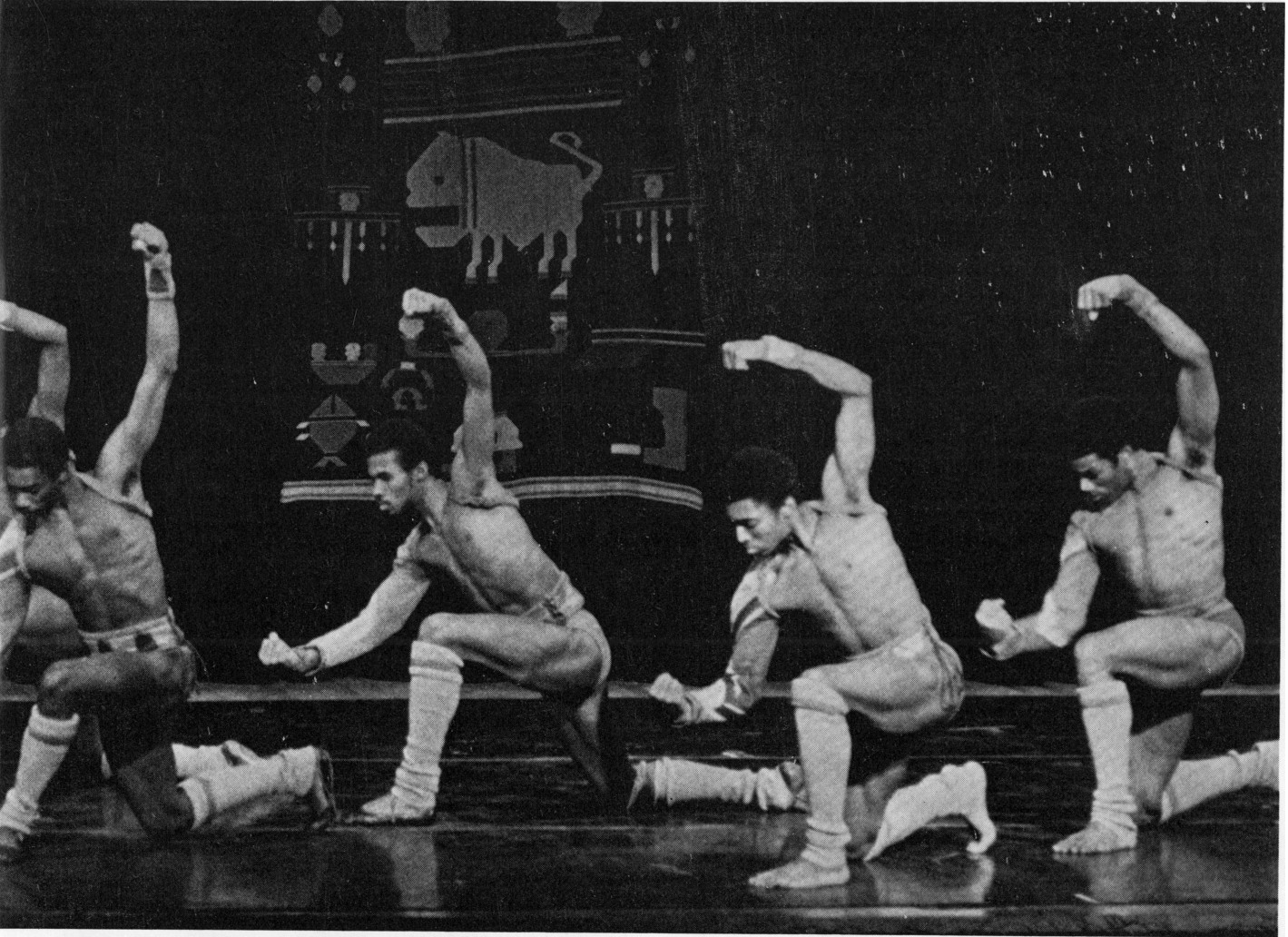
Mexican Jay Study Progresses The past year marked the tenth of a long-term study at the station



Dance performances, recitals and other on-stage

on social organization and population biology of the Mexican Jay. The study, aimed at understanding how the impact of natural selection on social behavior is influenced by such factors as population structure, has yielded much important data and led to greater interest by the scientific community in avian social systems. Probably the most extensive data bank of its kind was enlarged during the year as part of the study. More than 500 jays have been color-banded for identification, and computerized data are being kept on survival, flock membership, dispersal, breeding attempts, ancestors, offspring and other relatives.

Geology of Chiricahua Mountains Other research this year included a geological survey of the northern Chiricahua Mountains by Harold Drewes of the U.S.



presentations are part of the effort to provide educational and cultural programming.

Geological Survey, Denver; a study by Marcia Litte, University of Wisconsin, of the nesting biology and social behavior of the polistine wasp, *Mischocyttarus flavitarsis*; and an examination of color vision discrimination in the black-chinned hummingbird by Timothy Goldsmith, Yale University.

Richard Hutto, a graduate student at the University of Montana at Missoula, studied the migration ecology of wood warblers and graduate student Peter Blancher, Queen's University, Kingston, Ontario, collected nesting data and information on species distribution for his studies on Western and Cassin's Kingbirds. He concentrated on foraging behavior in relation to food supply and river habitats.

Colorado College students Jeffrey Lonn and Frederick Lewis studied the influence of geologic substrate on plant distribution. They found that plant

communities on limestone and andesite slopes showed wide and distinct variations, but determined that soil depth, texture and porosity played a more important role than subsurface rock types.

Station Widely Used Altogether, 345 scientists and students used the station; 759 naturalists also made use of the facilities. Sixteen papers based on work done wholly or in part at the station were published by visiting scientists. The publications of Museum staff who worked at the station are listed elsewhere in this report.

Vincent D. Roth, Resident Director, was appointed a Research Associate in Ecology and Evolutionary Biology at the University of Arizona and elected a Fellow of the Arizona-Nevada Academy of Science.

Department of Education

This department has considerably broadened the population of Museum-goers through a variety of educational programs and activities. These range from traditional school visits and courses for teachers to study tours, neighborhood outreach programs and special attractions. The department operates the Discovery Room, the Alexander M. White Natural Science Center and the People Center. In all, the department involves more than 300,000 people a year in Museum educational programs.

A memorable and poignant occasion coordinated by the department was the second annual Margaret Mead Film Festival in September, at which the distinguished anthropologist made her final public appearances. For five days, with undiminished spirit, wit and acuity, Dr. Mead once again carried a program of scientific importance to a lay audience. The festival introduced some 17,000 persons to the field of visual anthropology. Next year's festival again will be coordinated by the department.

The department also presented nine public performances in the Auditorium by musicians and dancers from Papua New Guinea. The programs were arranged in connection with the exhibition "Papua New Guinea: Then and Now," in Gallery 77. Nearly 10,000 visitors saw the performances, which were an excellent example of how such activities can supplement the educational value of an exhibition. During the POMPEII AD79 and Volcano! exhibitions, a series of eight films and slide programs in the Auditorium served a similar purpose. More than 2000 persons attended them.

Since Museum education is usually thought of as having to do with children, it is worth noting that programs such as those mentioned above are principally for adults. The prime example, the expanding Evening Lecture Series, had a record enrollment of nearly 4000 persons this year. The scope of this series reflected the Museum's exhibitions and collections, with classical archeology continuing to be the most popular subject. Offerings included "Archaeology of Ancient Europe," "Wildflowers of the Atlantic Seaboard," "Central Park," "Anthropology Through Films," "Socialization of Young Animals," "Magic and Witchcraft," and "Identifying Minerals and Rocks." In the area of professional training, in-service courses for teachers continued to be offered.

Identification Day One popular new event during the year was Identification Day, during which the public brought materials and specimens to the Museum on a Sunday afternoon to have them identified by the staff. As with many education programs, the scientific staff played a central role. The main entrance foyer on Central Park West was filled with tables, and with curious visitors who brought their artifacts and specimens to learn more about them.

Community Outreach The department's "community outreach" efforts covered a broad range of activities designed to reach particular audiences and groups, and to expand their awareness of the Museum's potential. Large audiences with significant local community representation attended special weekend programs devoted to the cultural traditions of African, Asian and Caribbean peoples. The effort included dance, music, films, classes for young people, lectures and other approaches. Substantial support from private foundations supplements these activities, especially the Mary F. Cary Charitable Trust, which has made outstanding contributions throughout the 1970's. Other contributors include the William Randolph Hearst, Henry Nias, Helena Rubinstein, Louis Caldér, and Vincent Astor Foundations, and the New York State Council on the Arts.

The outreach programs covered a broad range of subjects and activities. These included voodoo religion and its African roots; land law and succession in West Africa; African crafts and dances; Christmas celebrations in the Caribbean; Mexican folk music; Chinese shadow theater, and classical dances of India. Neighborhood workshops for young people and adult community groups covered natural science and anthropology subjects, and used the Museum's teaching collections.

The experimental Cultural Voucher Program, partially supported for the past four years by Museums Collaborative, Inc., is another part of the department's total community effort. The program provides selected community organizations with funds to make the best use of Museum services; this Museum is one of seven cultural institutions participating in this project. The program has resulted in an increase in classes the department provides for senior adult centers and community organizations particularly in black and Hispanic neighborhoods.

Junior High Special Program The Junior High School Natural Science Program, which provides a year-long science program for eighteen highly motivated students, completed its second year. Originally privately funded, it will continue next year thanks to a gift from the International Paper Company Foundation. Most of the students are residents of Harlem or East Harlem, and the program provides

a unique experience opening up career possibilities in science.

Four members of the Education staff participated in Discovery Tours this year. Malcolm Arth, Chairman, represented the Museum on its first Discovery Tour to Iran and the People's Republic of China. Assistant Chairman C. Bruce Hunter again lectured on the Maya civilization on a trip to Mesoamerica and also continued to conduct study programs in Colombia, Peru and Easter Island. Kenneth A. Chambers again led a study trip to Alaska, and Paul J. Sanfacon conducted a tour of Morocco.

Despite a school bus strike in February and March, which forced a number of cancellations of planned class visits, 32,000 pupils participated in core programs conducted by department staff. Nearly 6000 of them studied a subject in depth over several visits. Single visit programs, however, continued to be the mainstay of the programs for schools.

Natural Science Center Popular In addition to "World We Live In," the largest single visit program for classes, the Alexander M. White Natural Science Center also is used for classes on school day mornings, with 5000 pupils attending. During its public hours, especially on weekends, the center is visited by close to 100,000 persons a year. The Natural Science Center has provided a model for the department's other single-visit programs by developing

excellent pre- and post-visit materials for teachers and classes.

Also functioning in this dual capacity as a space for school programs and public activities on weekends are the People Center and Discovery Room. Most of the single-visit programs on anthropology topics are taught in the People Center. On weekends it is transformed into a place for live demonstrations reflecting customs and traditions of cultures all over the world.

Volunteers Provide Help Teaching Volunteers continued to conduct short teaching sessions in the Museum's exhibition halls for many of the 75 classes a day which are admitted to the Museum, by reservation, to move about on their own. These sessions are in addition to the classes booked for programs taught by staff members. This year, for the first time, volunteers worked with materials and specimens from the department's teaching collections.

In a smaller-scale but extremely important activity, the teaching volunteers work with visually-handicapped persons, providing materials and specimens which can be explored by touch. More than 400 visitors participated in this program, which began last year and is held in the Discovery Room.

Department of Exhibition and Graphics

The design and staging of POMPEII AD79 and the staff-produced companion exhibit Volcano! occupied much of the department's time and energies during the past year.

POMPEII AD79 was presented in the Museum's largest special exhibition space, Gallery 3. It afforded an intimate look at a surprisingly contemporary culture, frozen in time 1900 years ago by the eruption of Mount Vesuvius. The exhibition consisted of 350 magnificent examples of Roman art and artifacts excavated from its centuries-old blanket of volcanic ash. The exhibition drew large crowds here as it had previously in Europe, Boston, Chicago and Dallas, and was planned by the Exhibition Department with help from Margaret Cooper and Hetty Joyce, and installed under the supervision of Graphics Manager Joseph M. Sedacca. It opened April 22, and by the time it closed July 31, had attracted more than a half million visitors. POMPEII AD79 was arranged through the cooperation of the Italian Ministry of Culture.

Volcano!, with its fiery photographs and rumbling sound effects, took visitors inside an erupting



The next major special exhibition at the Museum will be "Gold of El Dorado: The Heritage of Colombia," opening November 13 in Gallery 3. A display of priceless gold artifacts from Bogota, Colombia, the exhibition is sponsored by Chemical Bank and the National Endowment for the Humanities. The Museum appearance will mark the start of a national tour for "Gold of El Dorado," which drew large crowds recently in London and Germany.

Buddhist monk Roon Phromkamnerd of Thailand volunteered to be "captured" by members of the Exhibition Department for display in the Peoples of Asia Hall, which opens in April. Using a process known as moulage cast, preparator Beth Sudekum, aided by senior principal preparators Dave Schwendeman (wearing glasses) and Derek Squires, cast the monk's head, hands and feet. For the finished display, the monk will be presented in saffron robe, holding a begging bowl.

volcano, let them peer down the cone, showed active volcanoes from Iceland to Indonesia, and explained the causes of volcanic eruptions. The exhibition, including continuously-running videotapes and volcanic rock specimens, explained the causes of the Mount Vesuvius eruption, and also outlined certain crucial benefits that stem from volcanoes.

Special exhibitions during the year included "Unseen Flowers of the Desert," a photographic collection of closeup views of tiny desert blooms hung in Akeley Gallery; and "Humanity's River," an audio visual tour of the Hudson River in the Hall of Ocean Life. Monthly exhibits, funded in part by the Arthur Ross Foundation, included "Nazca Ground Drawings," "Hummingbirds," the *Natural History* Magazine photo contest winners and the annual presentation of the holiday origami tree in the Rotunda.

New identification kiosks were installed at the 77th Street entrance and the 81st Street subway entrance.

Colorful banners announcing major exhibitions were installed on the front of the Roosevelt Memorial on Central Park West, including the striking red banner for POMPEII AD79. Smaller vertical banners on the light poles surrounding Roosevelt Park added to the splash of color around the Museum during the spring and summer.

For the dinners and special events held in the refurbished Hall of Ocean Life during the Pompeii exhibition, Ralph J.T. Bauer designed banners that were suspended from the ceiling and flanked the great Blue Whale. (See back cover.)

The Bowery Savings Bank invited the Museum to participate in its "Great Treasures of the City" exhibit series. The Museum displayed articles and photos designed to show a cross-section of what it has to offer, ranging from anthropology programs to fossil collections.

Henry Gardiner, Exhibit Design Chief, retired in May after 25 outstanding years of creative contributions to the Museum.

Library

The Library, containing one of the world's finest natural science research collections, supports the Museum staff in its scientific, educational and exhibition endeavors by acquiring and maintaining collections and providing reference, circulation and inter-library loan services. Its inter-library loan and reference service also serves the public and the scientific community at large.

A \$250,000 grant from the U.S. Department of Education was received this year to help improve the collections and services. It includes \$95,000 for the acquisition of retrospective (non-current) materials, \$40,000 for the completion of an automated serials catalog, and funds for seven support staff members.

Under the grant, the Technical Services Section, which handles all acquisitions, cataloging and processing of materials, was reorganized. The section also added some 950 monograph titles to the collection and registered 16,000 serial titles in the Library's computer data base.

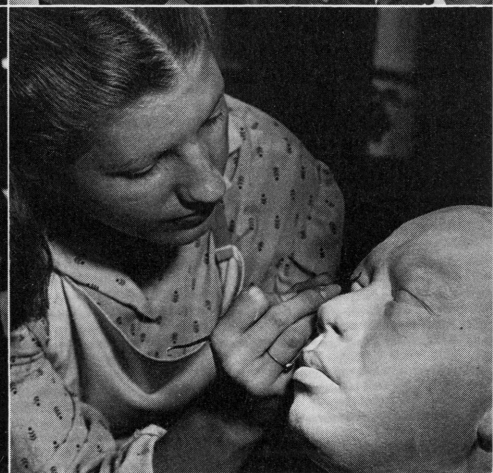
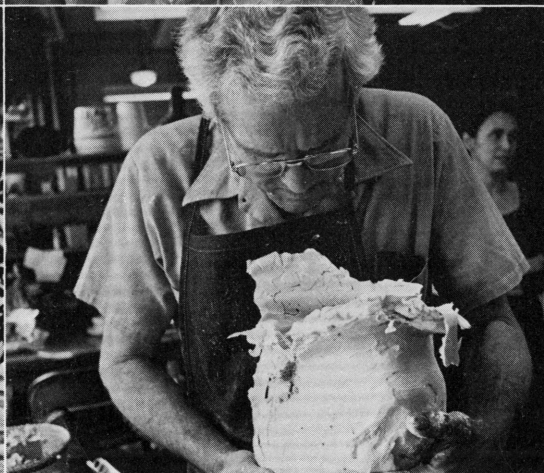
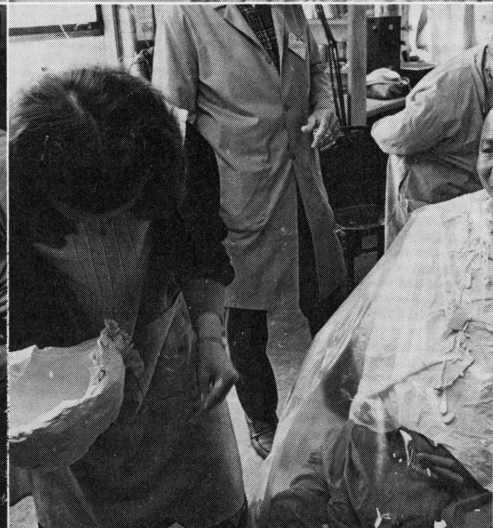
The Library has applied for an additional grant of \$485,000. It would extend for another two years the acquisition of non-current publications and the automation of monograph cataloging.

Photographic Collection The Museum's excellent Photographic Collection, consisting of pictures from the archives of old expeditions, historic fieldwork and other subjects, was transferred to the Library in April, 1978. Processing the collection has broken new ground in the complex field of photograph organization. As a first step towards cataloging, an inventory of 300 lots of color and black-and-white photographs was completed, and notes were compiled on the scope and content.

Book publishers, researchers and schools have continued to make extensive use of the collection: 13,591 copies of slides and photos were sold or rented for a total of \$42,247. The staff also answered 2509 reference questions, assisted 707 users and cataloged 227 prints.

Staff Activities Nina J. Root, Chief Librarian, wrote the HEW grant proposal and, with Pamela B. Haas, who has been named Photographic Collection Librarian, wrote two proposals for the support of that collection. She also researched, designed and mounted the exhibit, "Volcanoes in Books," and presented *The History of the AMNH Library* at the International Conference of the Society for the Bibliography of Natural History in London. She served on the Archives and Publications Committees of the New York Academy of Sciences; on the Membership and Exhibition Committees of the Grolier Club; and as the first woman convener of the Archons of Colophon.

Mildred Bobrovich, Assistant Librarian, researched information for "Surveying the U.S.," marking the 100th anniversary of Frederick Hayden's mapping expedition to the West. Miriam Tam, Assistant Librarian, also worked on the exhibit; in addition she managed the current HEW grant projects and worked on the new grant proposal. She also trained the new acquisitions, cataloging, and serials librarians, and attended several con-



tinuing education seminars.

Pamela B. Haas produced the brochure describing the collection, wrote a procedures manual and a reorganization plan, and, with Diana Shih, Cataloging Librarian, began work on a cataloging system. She also was elected to the Archons of Colophon, and attended seminars on the preservation of photographic images at Harvard University and the International Museum of Photography in Rochester.

Cataloging Productivity Up 500% Mary Giatas was appointed Acquisitions Librarian in July and began by clearing up a large backlog of orders and filing. She supervised the acquisition part of the HEW grant and worked on preservation and binding. She attended the American Libraries Association Mid-Winter Meeting, and wrote an article on the Library's restoration program. Diana Shih implemented the cataloging portion of the HEW grant. She increased the Cataloging Unit's productivity by more than 500% over the last year and revised the work flow so that books are cataloged within one week of receipt (half the previous time). Dorothy M. Fulton, Associate Manager, retired in February, after 35 years of service. She had supervised the Photographic Collection's color slide section from its inception in the 1940's.

Stack Space Opened Under a CETA program, stacks were shifted to provide storage space for 20,000 volumes of less frequently-used materials, plus the maps and pamphlet collection. The shift opened space for new acquisitions.

The Rare Book Room was reorganized to accommodate new equipment; out-of-scope and duplicate volumes from the Linguistics, Entomology and Invertebrate sections were removed under an on-going review project.

During the year, 7060 people used the Library; 48,529 items were circulated. The staff handled 5486 telephone requests and 3885 inter-library loan requests. A total of 1707 monograph titles were acquired and 3274 volumes were cataloged; 874 volumes were bound and restored, and 98,307 issues of Museum scientific publications were distributed.

Gifts to the Collection A number of contributors presented the Library with books, manuscripts, maps, photographs and slides. Major donations were received from Mrs. Alfred A. Loomis, Jr., Cyril dos Passos, and Joseph H. Hirshhorn. The Library also received a bronze bust of Gardner D. Stout by Eliot Goldfinger.

There were two major loans: a portfolio of 20 color photographs of the Pueblo Indians of New Mexico by David Ahre (1941) to Rutgers University, and a marble bust of Aristotle to the Commonwealth Fund.

Publications:

Giatas, Mary
1979.

Librarians Inspired at the American Museum of Natural History. *Library Scene*, vol. 8, no. 1, pp. 2-3.

Haas, Pamela
1979.

New York ASPP: Panel Discussion on Picture Research. *American Society of Picture Professionals Newsletter*, vol. 10, no. 5, pp. 10-11.

Root, Nina J.
1978.

Recent Publications. *Society for the Bibliography of Natural History North American Newsletter*, vol. 2, no. 1, pp. 7-8.

1979.

Zoology—Rare Serials and Monographs (A microform review). *Microform Reviews*, vol. 8, no. 1, pp. 53-54.

One of many TV monitors throughout the Museum used to give visitors up-to-the-minute information on POMPEII AD79 and other events.



Publications

Curator

The Editorial Board includes seven members from the American Museum plus representatives from the Alder Planetarium, the Metropolitan Museum of Art, the New-York Historical Society, the New York Zoological Society, and New York Botanical Gardens. Editorial Board members review manuscripts and suggest further sources of articles. The quality of submissions continues to grow, and the subscription and renewal rates are on the increase. A new assistant editor, Katharine D'Agosta, was appointed.

The new year will see a change in typeface for *Curator* and the inclusion of "Recent Publications in Natural History," a regular column featuring book reviews and a listing of new scholarly publications in the natural sciences, anthropology, earth and behavioral sciences, travel and expedition, museology, bibliography, reference, biography and history of natural history, and related subjects.

Scientific Publications

During the past year the office published five *Anthropological Papers*, totaling 436 pages; thirteen *Bulletins*, totaling 1593 pages; and 25 *Novitates*, totaling 528 pages, for a combined total of 2557 pages. Twelve articles for the three series are in preparation.

The majority of papers that appear in these three scientific series are written and illustrated by Museum scientists and artists, although a number are produced by researchers from other institutions as well. The subject matter ranges from anthropology to vertebrate paleontology.

Administration

Building Services Despite the extra workload placed on the department by POMPEII AD79 and Volcano!, the staff met the challenge. The Museum's public and non-public areas were kept clean and well-protected throughout the exhibitions.

Electric eye counters were installed in Gallery 3, Gallery 77, the Auditorium, and the Section of Meteorites, Minerals and Gems. These will improve statistical information on visits to special exhibits and programs, and on visitor preferences.

New Identification System The Museum introduced a new system of employee identification to replace the old photo I.D. badges. The new system still uses a photo identification card to be shown by employees when personal identification is required, such as when entering the Museum or restricted areas. During the work day, employees wear an attractive badge designed by Joseph M. Sedacca, Department of Exhibition and Graphics. This badge identifies individuals as Museum employees and includes each individual's name in large letters. Employees now are easily recognized when they enter non-public areas of the Museum, and also are easily recognized by Museum visitors. The new system will help employees protect Museum property and collections, and at the same time, identify them more easily to visitors so they can provide assistance.

TV Monitor Use Grows The use of TV monitors to provide the public with information regarding exhibits and other events in the Museum was greatly expanded during the year to aid in the dissemination of ticket and other information regarding POMPEII AD79. The messages on the TV monitors are created through a character-generating machine installed in the department.

Office of the Controller The office completed the transition from a machine bookkeeping accounting system to a computerized general ledger system. The new program produces management reports and compares the actual results with budgets for each cost and profit center. Individual managers are furnished with detailed reports, enabling them to monitor their expenditures.

Future plans include a detailed survey of the accounts payable system, the computerization of these records and the training of employees in computerized accounting techniques.

Museum Shops Shop sales exceeded the previous year's sales by more than 42%. The increase is partly due to increased visitation by the public, especially in connection with special exhibitions. At the same time, it is important to note that shop sales are growing at a significantly greater rate than Museum attendance.

A special sales shop built into the POMPEII AD79 exhibition proved very successful. But in addition to the significant sales in that new area, previously existing areas also showed substantial increases. Marketing Manager Martin Tekulsky and his personnel coordinated careful merchandise selection, imaginative display, and effective training and supervision of sales personnel.

The Museum Shop also was assigned responsibility for handling the catalog sales operations of the

Museum. The new catalog, which details the artistic reproductions and other attractive Museum gifts, has just been distributed.

New electronic registers were installed in all Museum Shop areas to provide better sales analysis and inventory control information.

Personnel During the past year the Personnel Office, under Geraldine M. Smith, recruited 206 new employees and processed 158 terminations and 33 promotions and/or transfers.

The program of flexible working hours, begun a year earlier on an experimental basis in three pilot departments, proved successful and was expanded to include twelve additional departments. The concept gives each employee options to organize working hours within certain departmental limitations. Staff participation in the program is now approximately 50%. The program will be extended to the remaining departments over the next two years.

For the fall, spring and summer semesters, 35 awards for tuition support were made to employees through the Frederick M. Warburg Scholarship Fund. Due to the great popularity of the program and its success in encouraging employees to continue their educational development, additional funding will be provided by the Museum in the coming year.

Plant Operation Two major construction projects were completed by the Construction and Maintenance Department under the direction of Manager Walter F. Koenig. Working against a very tight deadline, major improvements were made in the Hall of Ocean Life in time to use it as a much-needed banquet facility in connection with the many group visits to POMPEII AD79. (See back cover.)

New carpeting and ceramic tile finishes were completed on the gallery level of the hall, and wall carpeting with acoustical properties was installed on the curved walls there. Other improvements included the installation of perforated metal panels backed with acoustical materials in the false ceiling, painting the ceiling, construction of two new rest rooms on the basement level and installation of air cooling equipment and an additional emergency exit. The work involved participation by all of the skilled craftsmen in the construction and maintenance shops, but particular credit goes to Klaus A. Wolters, Foreman of Painters, and Carl Hilgers, Acting Foreman of Sheet Metal Workers. Their imaginative use of scaffolding, paint spraying and sheet metal techniques, and their leadership in coordinating the extra effort, enabled the Museum to complete the work within very limited time.

The other major project involved the cooperation of Construction and Maintenance forces with the Exhibition Department in constructing and installing POMPEII AD79 and Volcano!

The department worked on the continuing construction of the Gardner D. Stout Hall of Asian Peoples, the new Margaret Mead Hall of Peoples of the Pacific, and various other permanent and temporary exhibitions. Work also progressed on several new storage facilities including mammal storage on the third floor, fossil and reptile storage on the sixth floor and anthropology storage in the Columbus Avenue building.

Projection Department The department planned and assisted in the installation of the closed circuit television system used to provide information about the Museum's exhibits and programs to the public. It also helped prepare and present the Margaret Mead Film Festival. A number of Museum exhibits which previously used motion picture equipment were converted to video equipment, which requires less maintenance, produces a more consistent image quality, and is less costly to operate.

During the year the department continued to maintain and service the 131 items of audio visual equipment located in various exhibits throughout the Museum. This work is done on a daily basis. In addition, the department responded to more than 1600 requests for audio visual services from various departments. Audio visual services were provided for more than 329 evening and weekend programs that included lectures, films, slide shows, dance programs and musical renditions.

Development and Communications

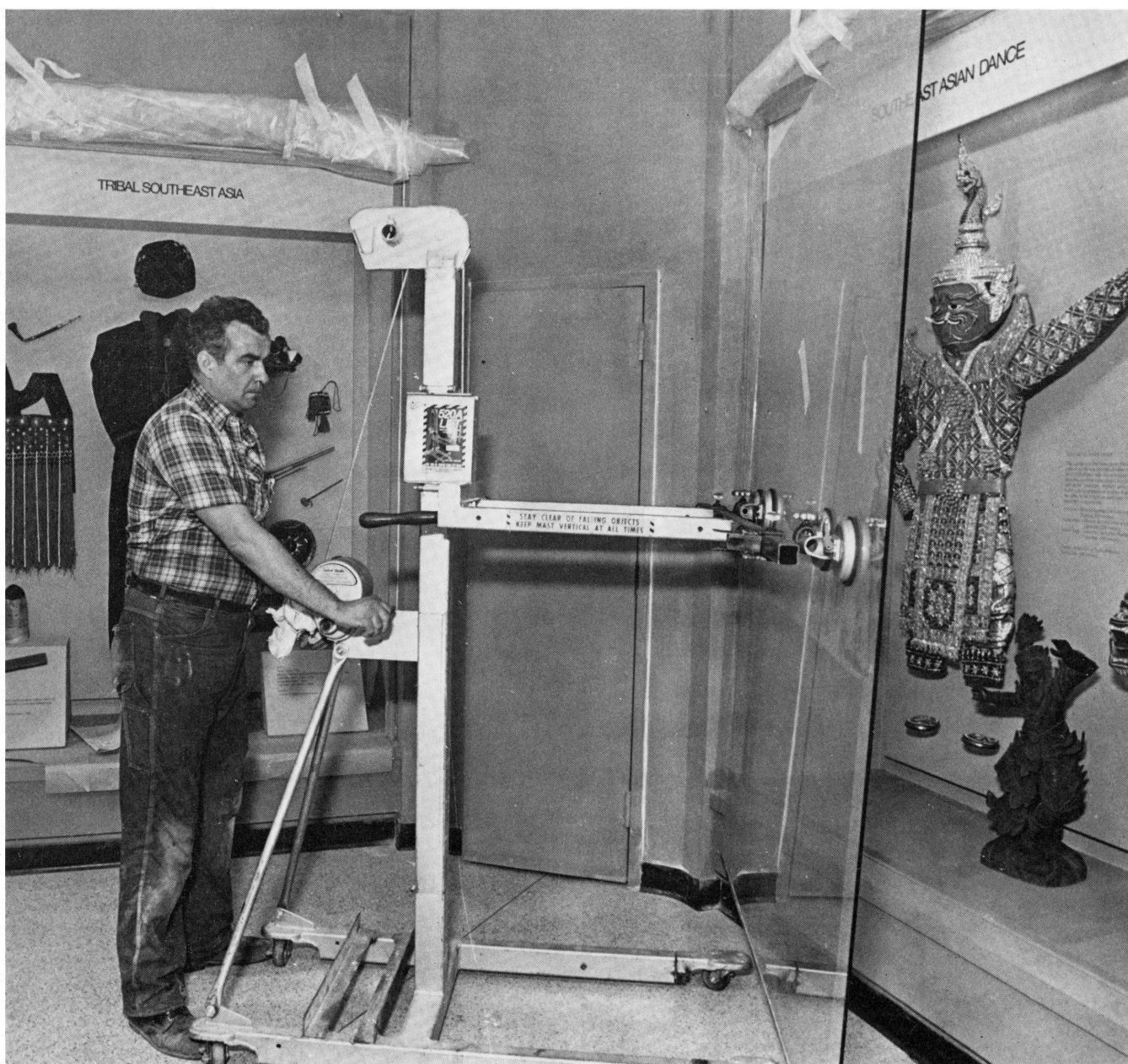
Response to Museum programs has been gratifying, marked by rising attendance, the attraction of new constituencies and growth of private support. This is in part the result of effective communication in the press and other media conducted by the Office of Public Affairs; by the monthly contact between *Natural History* magazine and 480,000 associate members; by the active dialogue between our 17,000 participating members and their own newsletter, *Rotunda*; and through direct communication to more than 1000 corporate donors and prospects.

The success of these efforts, combined with generous support from Trustees, foundations, and individual contributors, brought \$1,941,000 in general purpose income to the Museum this year. While the total was somewhat less than fiscal 1977-78, earnings are expected to improve in the coming year. However, one particularly encouraging area last year was special grants and funds for specific projects, which rose 9% to \$1,224,000.

New Readers for Magazine *Natural History* magazine won new readers as well as considerable national recognition and critical acclaim during the year. Audited circulation for the June/July issue was 476,000, a gain of 9% over the June/July 1978 issue.

Natural History's first entry into the National Magazine Awards competition was impressive. The magazine was a finalist in two categories out of 39 in a field of 570 entries. One selection as finalist was for visual excellence and the other was for the single-topic issue on the Great Lakes, which will soon be

Carl Hilgers, Acting Foreman of Sheet Metal Workers at the Museum, with the device he designed and assembled to facilitate the removal of the large panes of glass encasing the exhibitions. The Museum presented Mr. Hilgers with a merit award for his contribution.



published as a book, "The Enduring Great Lakes," by W. W. Norton. *Natural History* also won honorable mention from the Society of Magazine Designers for its November 1978 cover featuring a picture by an anthropologist of a Brazilian Indian boy.

Despite lower-than-expected advertising sales for August through December, sales were strong in the second half of the year, and revenue was up 20% over last year. Sales are handled by a division of Travel Communications, Inc.

The Margaret Mead Fund, launched in 1977 to raise \$5 million to meet important needs in collection care and to carry on Dr. Mead's work toward the advancement of anthropology, reached \$1.7 million last year. Contributions already have come from 5500 individuals and from a number of corporations and foundations. Much of the credit for the success of the campaign so far goes to Thomas J. Watson, Jr., chairman of the fund, and 60 prominent citizens who have joined his National Committee of Sponsors.

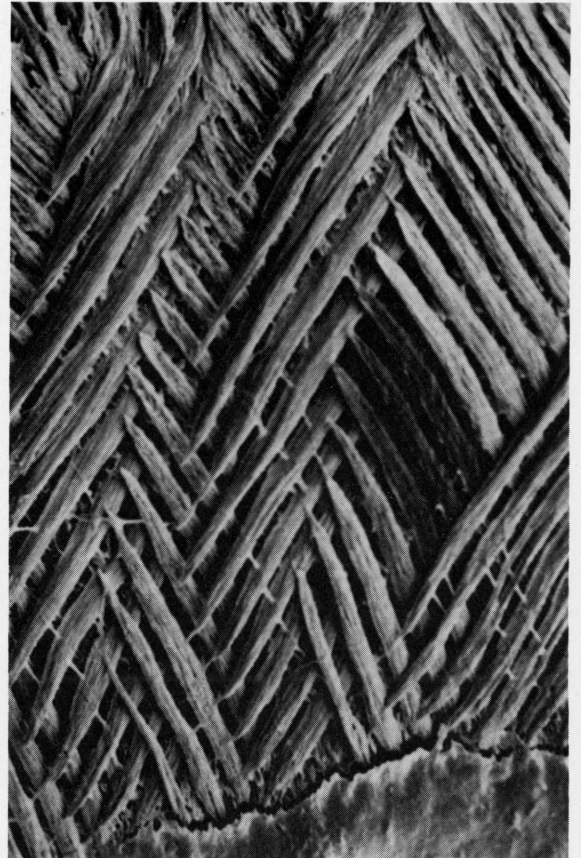
The membership promotion department relied heavily on direct mail, but continued to look for alternative methods of promoting circulation, including advertising in other publications and radio commercials. The department also studied ways to promote renewals.

A series of factors, including unusually large promotion mailings, postal increases and a 25% paper price increase, resulted in a 40% reduction in *Natural History's* earned surplus from the previous year. Intensive cost control, a planned increase in membership rates from \$10 to \$12, and higher advertising rates effective October 1979 promise to reverse the trend.

Participating and Donor Membership increased at a record rate, through a combination of members-only benefits for the POMPEII AD79 exhibition and a continued direct-mail effort to upgrade local Associate Members to higher categories. During the year, the Museum gained more than 7500 new members in the Participating category alone, bringing the total to a healthy 17,000 members.

Rotunda went from bimonthly to monthly publication in order to bring members more timely and complete information on Museum programs, events, and special exhibitions. A "Letter from the Field" column, written by Museum scientists about their research or field experience, was introduced. *Rotunda* also inaugurated a section for the children of members.

Development The successful Corporate Campaign, ably chaired by Trustee William F. May and assisted by 34 vice chairmen representing major in-



The Interdepartmental Laboratory, managed by Robert J. Koestler, houses large items of laboratory equipment: a scanning electron microscope, a computer and a wavelength spectrophotometer shared by the scientific departments. During the last year, 35 Museum scientists and visiting researchers used the laboratory to initiate, continue or complete research projects. Ten scientific papers and two popular articles were published using data collected from the equipment.

With the scanning electron microscope, scientists examined surface detail, at magnifications ranging from 10 times to 100,000 times, of such diverse objects as the spermatazoa transfer mechanism of male spiders, microscopic structure of natural gold crystals, wear patterns on archeological scraping tools, and the enamel of the rat's tooth shown above magnified 5000 times. The spectrophotometer and computer system were used together and separately for such projects as determination of color characteristics of *Myiarchus* flycatchers of South America, which aided in revision of the genus; and statistical analysis of data.



A Presidential Medal of Freedom, awarded posthumously to Margaret Mead, was accepted by her daughter, Catherine Bateson, left, at a ceremony in January. Andrew Young and Barbara Walters were among the participants in the Memorial Program.

dustries throughout the country, raised well over \$450,000 from 346 companies, a 20% increase over last year. Of particular significance, about \$140,000 qualified as matching funds under a challenge grant from the National Endowment for the Humanities. Under this program, the Museum received one dollar for every three dollars of new or increased contributions from private sources. (Challenge grant income is not included in this report.) Our success was due in part to the strong cultural and scientific interest shown by many corporations and to the dedicated efforts of the vice chairmen. A series of luncheon meetings held with leading executives played a key role in getting the Museum's message across.

In addition to corporate gains, increased private sector support came from Trustees, foundations, and many special friends of the Museum. Trustee generated contributions totaled \$768,000—up 50%—due to the hard work, perseverance, and dedication of our Trustees in generating support.

The Men's and Women's Committees, chaired respectively by Frank G. Lyon and Mrs. Robert V. Lindsay, generated more than \$200,000. In addition to the Junior Committee's benefit party last winter and a highly successful gala POMPEII AD79 evening, these committees helped stage a Museum benefit,

the annual Horse Show Ball, in the Roosevelt Rotunda.

Discovery Tours This program took Museum members and others to Alaska, Egypt, the Galapagos Islands, Peru, India, Morocco and Mexico. The Museum once again chartered the cruise ship *Orpheus*, and took a large group to Roman and Greek sites in Sicily, Tunisia, Malta, Turkey and the Greek Islands. High costs of promotion and sales coupled with underbooking, caused a substantial decrease in revenue from previous years. To help remedy this situation, future promotion will be limited to Museum members and individuals who express interest in the program.

Special Exhibitions A special staff—many of them volunteers—was assembled to help operate the POMPEII AD79 and Volcano! exhibitions, which drew large crowds and major interest to the Museum. Some worked behind the scenes, sending advance tickets to members and answering thousands of telephone inquiries. Others, such as the facilitator on the cover, wore the distinctive bright red tunics and worked in strategic locations to guide and assist the public. Over 570,000 people saw

A search for fossilized remains of bees that lived 50 million years ago took Museum personnel to Wyoming during the year. Jerome G. Rozen, Jr., Deputy Director for Research and Curator in the Entomology Department, accompanied by Malcolm C. McKenna, Curator, Department of Vertebrate Paleontology; Harold L. Cousminer, Research Associate, Department of Invertebrates; and Dr. Cousminer's son collected fossilized nests of bees that lived during Eocene times.

Extensive fossil deposits clearly revealed cell and burrow structure of the nests. Attempts will be made to sample contents of the 1000 cells brought back to learn what types of bees constructed the nests, what insects or other animals parasitized or preyed on the contents, and what plants the bees used for food. The investigation was supported in part by the Eppley Foundation.

POMPEII AD79 by the time it closed in July.

A special ticket distribution system helped keep things moving smoothly. It guaranteed members reserved admissions on any day of their choice, and also allowed large numbers of the public to visit the exhibition every day without reservations. Numbered tickets were distributed daily, and visitors were kept informed of their time of admission by means of the Museum's television monitors.

Public Affairs POMPEII AD79's already substantial publicity generated during its national tour was enhanced by a strong advertising and news campaign in New York. Pompeii was the subject of a cover story in the *Daily News Sunday* magazine, and Martin Prinz, Chairman and Curator of the Department of Mineral Sciences, discussed volcanoes on the Today Show.

Two brief television news spots were produced and shown on several hundred stations in major market areas throughout the country. One dealt with Volcano!; the other covered the Museum's reproduction of a Triceratops dinosaur for display in another museum.

The office coordinated the news of the death of Margaret Mead, which received intensive, world-wide attention.

Guest Services In addition to lectures, meetings, classes and screenings, Guest Services coordinated and carried out 1213 special events sponsored by the Museum and outside organizations. These included formal dinners, luncheons, receptions, press previews and conferences, symposia, musical programs, lectures, movies and television filmings, fund raising events, special tours, exhibition previews and all social events connected with POMPEII AD79.

Pamphlets showing the Museum's floor plan were

revised and redesigned. In addition to editions in English, plans are now available in French, German, Spanish, Italian and Japanese. A total of 446,500 floor plans helped guide visitors around the Museum.

Visitor information centers, hotels, airlines and other outlets received 130,950 general information folders; 152,500 bi-monthly calendars of events also were published. In the Museum, Guest Services provided topical information for the closed-circuit television system. It also offered recorded telephone messages which reached approximately 180,000 potential visitors.

Approximately 517,000 visitors and employees, and 142,300 school children were served by the cafeteria.

Volunteers Great demands were placed on the volunteer program by increased attendance and special exhibitions, and once again, the volunteers rose to the challenge. In addition to helping in offices, laboratories and teaching areas behind the scenes, the volunteers were responsible for the information desks, providing information and selling memberships, tickets and Museum Shop goods. New electronic cash registers were installed at each desk.

Volunteers assisted in many phases of the special exhibitions and had specific responsibility for the reception of school classes and visits by the aging and handicapped. Without their help, the Museum would not have been able to serve the public so well.

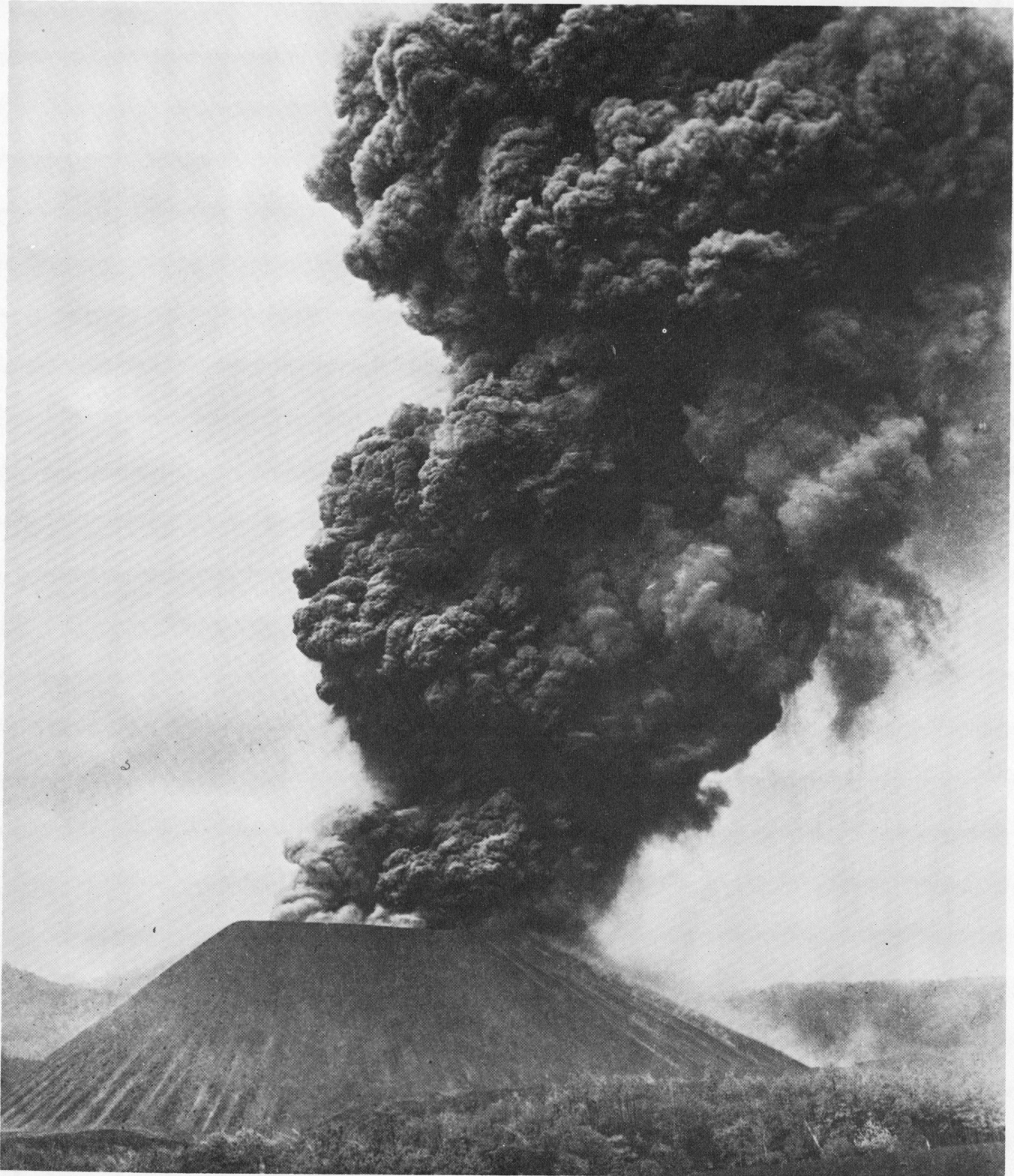
The Highlight and History tours gave 43,288 visitors an introduction to the Museum. The tours are distinguished not only by the quality of their contents, but also for their capacity to make the museum halls and exhibitions come alive. Sarah E. Flanders, who directs the program, received the Mayor's Citation of Merit for 1978 for her efforts in this important program.

Attendance during the past year was 2,686,240. This figure includes 2,128,301 persons visiting the Museum and 557,939 (including 537,478 paid admissions) visiting the Planetarium.

Increases in Museum membership categories were reported as follows: Donors—700, an increase of 400; Participating Members—17,000, an increase of 7,000; Associate Members—412,300, an increase of 27,200 over the previous year.

The awesome power of natural forces within the earth's mass is only hinted at in this billowing display by the Mexican volcano Paricutin. But it brings a reminder that those forces are still there, as they were in AD79 when Mount Vesuvius split the air with its eruptions and buried the Roman resort city of Pompeii under molten ash.

Accompanying the POMPEII AD79 exhibit, was a second exhibition called Volcano!, prepared by the Museum's Department of Mineral Sciences. In addition, the American Museum Hayden Planetarium offered a special show entitled "Last Nights of Pompeii," which examined the sky as seen over Southern Italy in the final hours of Pompeii.



Treasurer's Report

The Financial Statements of the American Museum of Natural History, audited by Coopers and Lybrand, appear on the following pages.

In reviewing the Balance Sheet it should be noted that investments in marketable securities are recorded at cost and consist of General Funds of \$3,800,929, Special Funds of \$5,411,409 and Endowment Funds of \$44,938,344. The total cost of the marketable securities amounts to \$54,150,682. General Fund investments represent cash received from members for benefits due them in future years and generally are offset by unearned Membership Income of \$3,869,219, which appears as a liability. Special Fund investments represent contributions received from private donors and government agencies, or allocated by the Museum administration, which have been set aside for the completion of special scientific educational or exhibition projects. The Endowment Fund consists of the balance of funds donated to the Museum since its organization in 1869. Income provided from the Endowment Funds is used to support both General Fund and Special Funds activities. The total market value of these securities on June 30, 1979 amounted to \$57,485,937 which is \$3,335,255 greater than cost, as detailed in Note 1 accompanying the financial statements.

The Statement of Revenues and Expenses of Current Funds covers the revenues and expenses of both the General and Special Funds. Although the total revenues of these funds during fiscal 1979 increased over the prior year by \$2,163,357 to \$20,151,902, the total expenses for the year increased by \$2,681,813 to \$20,488,557. After adjusting for the support grant from the New York State Council on the Arts of \$571,200 in fiscal 1979 and \$510,000 in fiscal 1978, the revenue exceeded expenses by \$234,545 in fiscal 1979, compared to \$691,801 in fiscal 1978. Although on a combined basis these figures show an excess of revenues over expenses of \$234,545 in fiscal 1979, it should be noted that Special Fund programs, many of which take more than a year to complete, are restricted in nature and not available to support General Fund programs.

In the current year, General Fund revenues amounted to \$14,089,317 and were \$923,508 greater than the preceding year, while General Fund expenses were \$15,313,999, or \$1,329,061 greater than the preceding year. This resulted in an excess of \$1,224,682 of expenses over revenues before adjustment for the New York State Council on the Arts support grant in fiscal 1978-1979 compared to \$819,129 in fiscal 1977-1978. After deducting the support grant of \$571,200 in 1979 and \$510,000 in 1978, the net operating deficit of the General Fund amounted to \$653,482 for 1979 compared to \$309,129 for the preceding year. It should be noted that in comparing fiscal 1978-1979 with 1977-1978

revenue from the City of New York increased \$202,332; this increase represented payments to cover negotiated increases in salaries and related social benefits for the prior and current year to personnel paid from funds provided by the City. It does not represent an increased level of support from the City. The increase in net income from investments of \$148,676 reflects primarily higher interest and dividend rates on our invested funds. As a result of successful membership drives, Membership Revenue was \$416,447 greater than the preceding year.

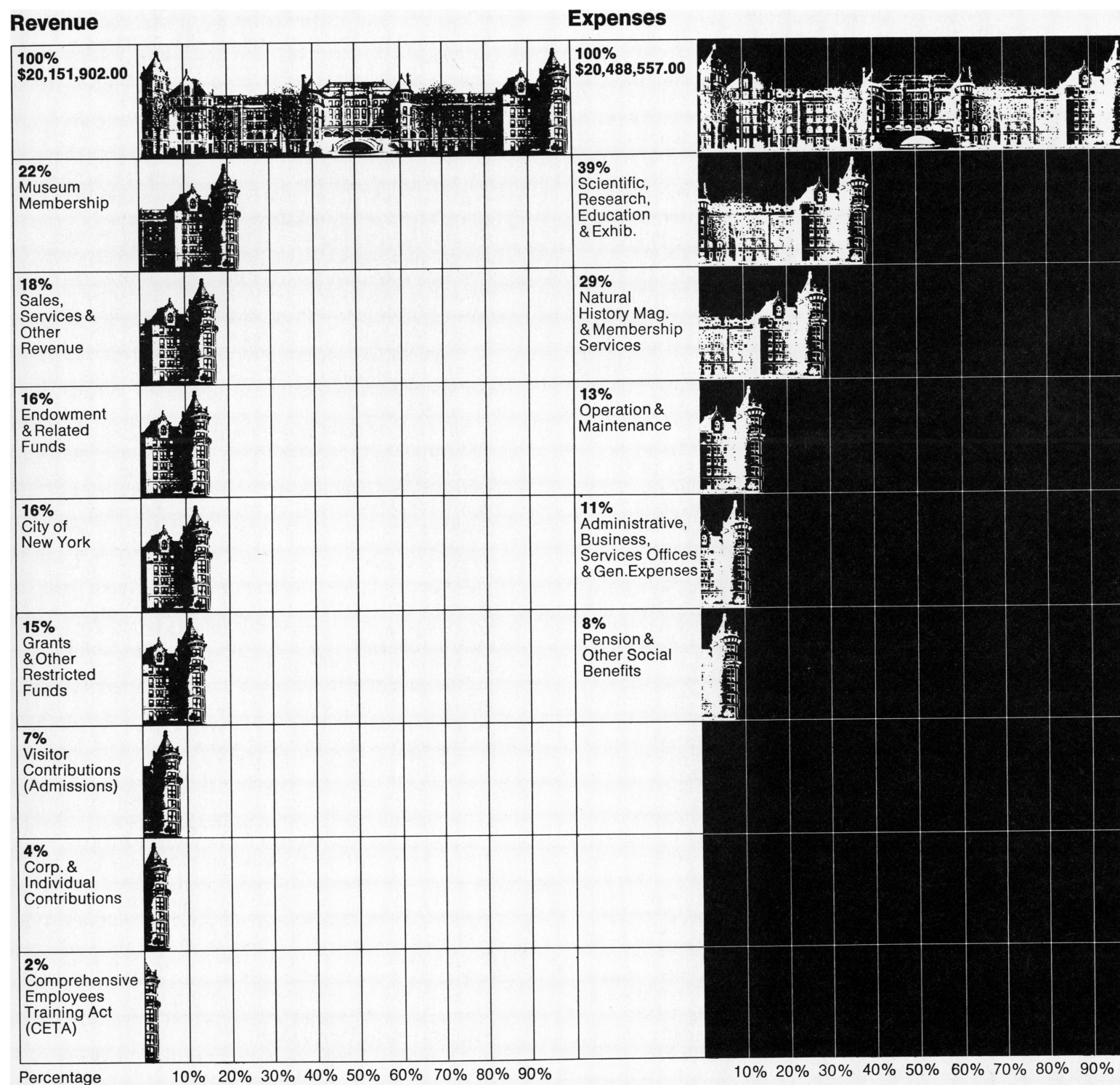
Two items of General Fund expenses that increased significantly were Natural History Magazine expenses by \$726,551 and Administrative and General Expenses by \$263,613. The increase in Natural History Magazine expenses reflects the cost of servicing new Museum members with the benefits due them, promotional costs incurred to obtain new members, and an increase in the cost of services and supplies used in the publication of the Natural History Magazine. The increase in Administrative and General Expenses predominantly represents additional costs incurred in purchasing services and supplies to operate the administrative offices of the Museum.

Although General Fund revenues increased 7% compared to the preceding year, this increase was insufficient to cover the increase of 9½ % in General Fund expenses. The Museum administration is constantly exploring means of increasing revenues from existing sources and of developing new sources of revenue. Continuous promotional efforts are made to increase Museum membership and, in addition, we plan to raise Associate Members dues during 1980 to help absorb the increase in costs of publishing Natural History Magazine. We have introduced a Museum catalogue and expanded the facilities of the Museum Shop, (not only increasing the opportunities for members and the general public to purchase reproductions, books and novelties related to Natural History, but also to increase the revenues from these sources.

The administration is closely monitoring all costs and constantly seeking effective and less costly means of providing the services currently rendered to the general public and scientific community without sacrificing their quality. Notwithstanding these efforts, we have not been able to increase revenues sufficiently to absorb the increased costs incurred, largely due to the devastating effects of inflation. We must look to private donors, corporate benefactors and the general public to help us close the gap that exists between revenues and expenses so that this institution can continue to provide the educational research, exhibitions and services that has made the American Museum of Natural History a world renowned institution.

Frederick A. Klingenstein, *Treasurer*

**1978/1979 Percentages For Current Funds
(General and Special Funds)**

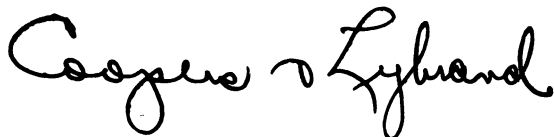


Auditors' Report

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

We have examined the balance sheets of the AMERICAN MUSEUM of NATURAL HISTORY as of June 30, 1979 and 1978 and the related statements of revenue and expenses of current funds and changes in fund balances for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of the American Museum of Natural History as of June 30, 1979 and 1978 and the results of its operations for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.



1251 Avenue of the Americas
New York, New York 10020
October 11, 1979.

American Museum of Natural History Balance Sheets, June 30, 1979 and 1978

ASSETS:

Cash
Accrued interest and dividends receivable
Accounts receivable, less allowance for doubtful
accounts of \$115,717 in 1979 and \$80,465 in 1978
Due from City of New York
Due from other funds
Investments in marketable securities (Note 1)
Planetarium Authority bonds (Note 2)
Museum Shop inventory
Prepaid expenses

LIABILITIES and FUNDS:

Accounts payable and accrued liabilities
Accrued employee benefit costs
Payable for securities purchased
Due to other funds
Unearned membership income
Funds:
General Fund (deficit)
Special Funds (Notes 3 and 4)
Endowment Funds (Note 5)

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

1979				1978			
Current Funds				Current Funds			
General Fund	Special Funds	Endowment Funds	Total	General Fund	Special Funds	Endowment Funds	Total
\$ 114,086	\$ 5,189	\$ 170,480	\$ 289,755	\$ 54,029	\$ 13,419	\$ 107,361	\$ 174,809
395,179	100,596		495,775	410,183	110,298		520,481
693,346	435,508		1,128,854	358,312	696,642		1,054,954
58,593			58,593	152,214			152,214
3,800,929	5,411,409	44,938,344	54,150,682	4,093,552	125,661	45,051,433	53,449,240
	425,000		425,000		425,000		425,000
317,239			317,239	139,273			139,273
1,033,955	52,215		1,086,170	899,058	5,500		904,558
<u>\$6,413,327</u>	<u>\$6,429,917</u>	<u>\$45,108,824</u>	<u>\$57,952,068</u>	<u>\$6,106,621</u>	<u>\$5,680,775</u>	<u>\$45,158,794</u>	<u>\$56,946,190</u>
\$1,583,290	\$ 246,242		\$ 1,829,532	\$1,666,654	\$ 98,250		\$ 1,764,904
1,314,300			1,314,300	1,206,830			1,206,830
		\$ 52,706	52,706			\$ 125,661	125,661
3,869,219			3,869,219	3,543,649			3,543,649
(353,482)			(353,482)	(310,512)			(310,512)
	6,183,675		6,183,675		5,582,525		5,582,525
		45,056,118	45,056,118			45,033,133	45,033,133
<u>\$6,413,327</u>	<u>\$6,429,917</u>	<u>\$45,108,824</u>	<u>\$57,952,068</u>	<u>\$6,106,621</u>	<u>\$5,680,775</u>	<u>\$45,158,794</u>	<u>\$56,946,190</u>

Statements of Revenue and Expenses of Current Funds for the years ended June 30, 1979 and 1978

	General Fund		Special Funds		Total	
	1979	1978	1979	1978	1979	1978
Revenue:						
Appropriation from the City of New York	\$ 3,173,373	\$ 2,971,041			\$ 3,173,373	\$ 2,971,041
Comprehensive Employees Training Act (CETA)	375,530	404,017			375,530	404,017
Gifts, bequests and grants	879,453	759,420	\$3,055,025	\$2,513,457	3,934,478	3,272,877
Net income from investments	2,417,909	2,269,233	756,486	610,369	3,174,395	2,879,602
Visitors' contributions			1,433,642	1,206,660	1,433,642	1,206,660
Museum membership	4,353,032	3,936,585			4,353,032	3,936,585
Other revenue, net	2,890,020	2,825,513	817,432	492,250	3,707,452	3,317,763
Total revenue	<u>14,089,317</u>	<u>13,165,809</u>	<u>6,062,585</u>	<u>4,822,736</u>	<u>20,151,902</u>	<u>17,988,545</u>
Expenses:						
Scientific and educational activities	3,075,188	2,920,306			3,075,188	2,920,306
Exhibition halls and exhibits			1,481,954	1,512,742	1,481,954	1,512,742
Natural History Magazine	5,937,651	5,211,100			5,937,651	5,211,100
Other special purpose programs and projects			3,360,918	1,973,441	3,360,918	1,973,441
Administrative and general	2,214,879	1,951,266	132,313	144,175	2,347,192	2,095,441
Plant operating and maintenance	2,712,144	2,636,009			2,712,144	2,636,009
Pension and other social benefits (Note 6)	1,374,137	1,266,257	199,373	191,448	1,573,510	1,457,705
Total expenses	<u>15,313,999</u>	<u>13,984,938</u>	<u>5,174,558</u>	<u>3,821,806</u>	<u>20,488,557</u>	<u>17,806,744</u>
Excess of revenue over expenses (expenses over revenue) before support grant	(1,224,682)	(819,129)	888,027	1,000,930	(336,655)	181,801
Support grant (Note 7)	<u>571,200</u>	<u>510,000</u>			<u>571,200</u>	<u>510,000</u>
Excess of revenue over expenses (expenses over revenue)	<u>(\$ 653,482)</u>	<u>(\$ 309,129)</u>	<u>\$ 888,027</u>	<u>\$1,000,930</u>	<u>\$ 234,545</u>	<u>\$ 691,801</u>

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

**Statements of Changes in
Fund Balances
for the years ended
June 30, 1979 and 1978**

	Current Funds				Endowment Funds	
	General Fund		Special Funds		1979	1978
	1979	1978	1979	1978		
Balance (deficit), beginning of year	(\$310,512)	(\$180,423)	\$5,582,525	\$4,453,997	\$45,033,133	\$45,855,181
Additions:						
Gifts, bequests and grants					113,576	34,349
Interest and dividend income					118,703	101,002
Net gain (loss) on sale of investments					321,317	(443,970)
Excess of revenue over expenses, as annexed			888,027	1,000,930		
Total additions			888,027	1,000,930	553,596	(308,619)
Deductions:						
Excess of expenses over revenue, as annexed	653,482	309,129				
General administrative expenses					87,034	85,137
Prior service contributions to CIRS (Note 6)					119,942	121,654
Total deductions	653,482	309,129			206,976	206,791
Transfer between funds:						
Financing of:						
1978 and 1977 General Fund deficits	310,512	180,423	(9,989)		(300,523)	(180,423)
Special Funds activities		(1,383)	23,112	143,510	(23,112)	(142,127)
Other (Note 8)	300,000		(300,000)	(15,912)		15,912
Total transfers	610,512	179,040	(286,877)	127,598	(323,635)	(306,638)
Balance (deficit), end of year	(\$353,482)	(\$310,512)	\$6,183,675	\$5,582,525	\$45,056,118	\$45,033,133

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

Statement of Significant Accounting Policies

The Museum maintains its accounts principally on the accrual basis.

The land and buildings utilized by the Museum (most of which are owned by the City of New York), fixed assets (which are charged off at time of purchase), exhibits, collections and the Library are not reflected in the balance sheet.

To ensure observance of limitations and restrictions placed on the use of the resources available to the Museum, the accounts of the Museum are maintained in accordance with the principles of "fund accounting." This is the procedure by which resources for various purposes are classified for accounting and financial reporting purposes into funds that are in accordance with activities and objectives specified. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups. Accordingly, all financial transactions have been recorded and reported by fund group.

Within current funds, fund balances restricted by outside sources or by the Board of Trustees are so indicated (Special Funds) and are segregated from the General Fund. These Special Funds may be utilized only in accordance with the purposes established for them as contrasted with the General Fund over which the Trustees retain full control to use in the general operation of the Museum.

Endowment Funds include (a) funds subject to restrictions established by the donor requiring that the original principal be invested in perpetuity, and (b) funds established by donors or Trustees (funds functioning as endowments) where the principal may be expended with the approval of the donor or the Trustees.

Income derived from investments of Endowment Funds is distributed to the current funds on a unit basis which reflects the ratio of the related funds invested in the pooled portfolio at market value.

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

Museum Shop inventory is stated at the lower of cost (first-in, first-out method) or market.

Membership income is recognized as income ratably over the membership term and a portion of that income is allocated to the Natural History Magazine.

The Museum accrues and funds annually the normal cost of eligible employees participating in the Cultural Institutions Retirement System ("CIRS") Pension Plan. The unfunded prior service cost, with interest, is being funded over 30 years ending in fiscal 2004.

Notes to Financial Statements

1. Cost and market quotations of investments at June 30 are as follows:

General Fund
Special Funds
Endowment Funds

The Museum's investments consist of the following:
Short-term obligations
Bonds
Common stocks

2. The investment in bonds (\$570,000 principal amount) of the American Museum of Natural History Planetarium Authority is carried at cost. The financial statements of the Planetarium, which is operated under the supervision of the Museum, are annexed. Interest income of \$25,650 received from the Planetarium in the years ended June 30, 1979 and 1978 is included in net income from investments of the General Fund.
3. Included at June 30, 1979 in Special Funds (funds which are received or appropriated for specific purposes) are approximately \$2,800,000 of funds restricted by the donor as to use.
4. The balances at June 30, 1979 and 1978 of Special Funds are net of overdrafts of certain of these funds of approximately \$175,000 and \$173,000, respectively. These overdrafts represent expenditures in anticipation of transfers from Endowment and/or General Funds, receipt of gifts and grants, or the sale of property and equipment utilized by the Special Funds.
5. Endowment Funds (including funds functioning as Endowment Funds) are summarized as follows:

Endowment Funds, income available for:

Restricted purposes
Unrestricted purposes
Funds functioning as endowment, principal
and income available for:
Restricted purposes
Unrestricted purposes

1979		1978	
Cost	Market	Cost	Market
\$ 3,800,929	\$ 3,793,734	\$ 4,093,552	\$ 4,007,939
5,411,409	5,400,967	4,304,255	4,213,474
44,938,344	48,291,236	45,051,433	47,037,331
<u>\$54,150,682</u>	<u>\$57,485,937</u>	<u>\$53,449,240</u>	<u>\$55,258,744</u>
\$10,950,449	\$10,941,888	\$ 8,462,750	\$ 8,462,665
15,853,370	15,550,917	16,668,357	16,175,457
27,346,863	30,993,132	28,318,133	30,620,622
<u>\$54,150,682</u>	<u>\$57,485,937</u>	<u>\$53,449,240</u>	<u>\$55,258,744</u>

6. All eligible employees of the Museum are members of the CIRS Pension Plan (the "Plan"). The cost of the Plan amounted to approximately \$661,000 in fiscal 1979 and \$650,000 in fiscal 1978. Of these amounts, approximately \$120,000 in fiscal 1979 and \$122,000 in fiscal 1978 were funded through the Pension Support Endowment Fund. The balance of approximately \$541,000 in fiscal 1979 and \$528,000 in fiscal 1978 was charged to current funds (which included normal service costs and amortization of unfunded past services cost over a 20 year period).

7. In fiscal 1979 and 1978, grants were received from the New York State Council on the Arts towards the support of the General Fund's Operations.

8. Special Funds revenues include \$300,000 in fiscal 1979 and 1978 received from the National Endowment for the Humanities. In fiscal 1979, \$300,000 of these funds were transferred from Special Funds to the General Fund.

9. The Museum provides certain services, including accounting and maintenance services, for which the Planetarium was charged an aggregate amount of

\$89,359 in fiscal 1979 and \$86,176 in fiscal 1978.

10. Certain amounts in the fiscal 1978 financial statements have been reclassified to conform with the fiscal 1979 presentation.

11. The Museum is a nonprofit organization exempt from income tax under Section 501(c)(3) of the Internal Revenue Code.

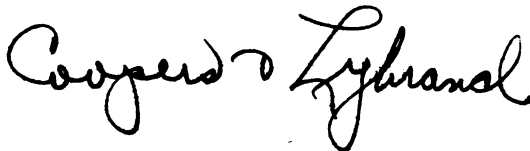
June 30	
1979	1978
\$20,586,062	\$20,566,232
7,564,613	7,595,628
5,092,746	5,000,992
11,812,697	11,870,281
<u>\$45,056,118</u>	<u>\$45,033,133</u>

Auditors' Report

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

We have examined the balance sheets of the AMERICAN MUSEUM of NATURAL HISTORY PLANETARIUM AUTHORITY as of June 30, 1979 and 1978 and the related statements of income and expenses and of changes in restricted funds and deficit for the years then ended. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of the American Museum of Natural History Planetarium Authority at June 30, 1979 and 1978 and the results of its operations for the years then ended in conformity with generally accepted accounting principles applied on a consistent basis.



1251 Avenue of the Americas
New York, New York 10020
October 11, 1979.

American Museum of Natural History Planetarium Authority Balance Sheets, June 30, 1979 and 1978

ASSETS:

Cash
Short-term investments
Accounts receivable
Inventory (publications and souvenirs)

Equipment, fixtures, etc.:
Zeiss planetarium instrument, at cost
Building improvements, at cost

Less, Allowance for depreciation
(Note 7)

Furniture, fixtures and equipment

Buildings, at cost

LIABILITIES:

Accounts payable
Accrued employee benefit costs
4½ % Refunding Serial Revenue bonds,
past due (Note 1)
Accrued interest, past due

CONTRIBUTED CAPITAL, RESTRICTED FUNDS and DEFICIT:

Contributed capital:
Charles Hayden
Charles Hayden Foundation
The Perkin Fund

Restricted funds:
Trust Agreement Fund
Guggenheim Foundation Fund (Note 2)
Other (Note 3)
Deficit, as annexed

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

Statements of Income and Expenses for the years ended June 30, 1979 and 1978

1979	1978
\$ 6,183	\$ 8,985
300,000	350,000
19,502	8,401
33,823	30,555
<u>359,508</u>	<u>397,941</u>
221,928	221,928
307,668	235,617
<u>529,596</u>	<u>457,545</u>
(179,689)	(128,924)
<u>349,907</u>	<u>328,621</u>
1	1
<u>349,908</u>	<u>328,622</u>
1,019,210	1,019,210
<u>\$1,728,626</u>	<u>\$1,745,773</u>
1979	1978
\$ 139,879	\$ 111,561
81,511	75,295
570,000	570,000
315,450	315,450
<u>1,106,840</u>	<u>1,072,306</u>
156,869	156,869
429,455	429,455
400,000	400,000
<u>986,324</u>	<u>986,324</u>
2,500	2,500
	(9,621)
390,638	448,477
(757,676)	(754,213)
<u>621,786</u>	<u>673,467</u>
<u>\$1,728,626</u>	<u>\$1,745,773</u>

	1979	1978
Income:		
Admission fees, less allowances and commissions	\$622,178	\$556,962
Auxiliary activity, sales booth	133,346	123,022
Special lectures and courses	36,513	40,992
Other income and grants	39,173	26,790
Total income	<u>831,210</u>	<u>747,766</u>
Expenses:		
Preparation, presentation and promotional	394,993	345,873
Operation and maintenance	191,835	162,677
Auxiliary activity, sales booth	107,125	93,957
Administrative and general	55,232	48,859
Pension and other social benefits (Note 4)	73,732	77,044
Total expenses	<u>822,917</u>	<u>728,410</u>
Income before interest and depreciation	8,293	19,356
Interest on past due 4½ % Refunding Serial		
Revenue bonds	(25,650)	(25,650)
Provision for depreciation	(50,765)	(29,176)
Loss from operations before support grant	<u>(68,122)</u>	<u>(35,470)</u>
Support grant (Note 6)	25,000	10,000
Net loss	<u>(\$ 43,122)</u>	<u>(\$ 25,470)</u>

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

**Statements of Changes in
Restricted Funds
and Deficit
for the years ended
June 30, 1979 and 1978**

	Billy Rose Foundation Fund	Guggenheim Foundation Fund (Note 2)	Other (Note 3)	Deficit
Balance, June 30, 1977	\$1,471	\$15,066	\$409,553	(\$760,540)
Additions:				
Contributions		6,500	50,250	
Proceeds from special presentations			210,584	
Income from investments			24,563	
Expenditures:				
Special purpose programs and projects	(1,471)	(31,187)	(104,631)	
Special presentation expenses			(110,045)	
Transfers between funds (Note 7)			(31,797)	31,797
Net loss, as annexed				(25,470)
Balance, June 30, 1978	—	(9,621)	448,477	(754,213)
Additions:				
Contributions		10,500	3,750	
Proceeds from special presentations			140,374	
Income from investments			30,121	
Expenditures:				
Special purpose programs and projects		(879)	(35,185)	
Special presentation expenses			(157,240)	
Transfers between funds (Note 7)			(39,659)	39,659
Net loss, as annexed				(43,122)
Balance, June 30, 1979	—	—	\$390,638	(\$757,676)

The accompanying statement of significant accounting policies and notes are an integral part of these financial statements.

Statement of Significant Accounting Policies

The Planetarium's corporate charter terminates when all its liabilities, including bonds, have been paid in full or otherwise discharged. At that time, its personal property passes to the American Museum of Natural History and real property to the City of New York to be maintained and operated in the same manner as other city property occupied by the Museum. The land utilized by the Planetarium was donated by the City of New York.

The policy of the Planetarium is to capitalize only major plant additions and replacements of equipment, machinery and other items and to depreciate such items on the straight-line method over their useful lives. Fully depreciated assets are carried at nominal value. Because of the nature of the ownership of the property, provision for depreciation of the buildings is considered unnecessary.

Short-term investments are stated at cost, which approximates market value.

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

Fund balances restricted by outside sources or by the Management Board are so indicated (restricted funds). These restricted funds may only be utilized in accordance with the purposes established by the source of such funds.

The Planetarium and its employees participate in Cultural Institutions Retirement System (CIRS) Pension Plan. The Planetarium's policy is to fund pension expense accrued.

Notes to Financial Statements

1. The Planetarium Authority bonds were purchased by the American Museum of Natural History ("Museum") in 1948. The Charles Hayden Foundation contributed \$200,000 to the Museum toward the purchase of such bonds.
2. In fiscal 1972 the Daniel and Florence Guggenheim Foundation contributed \$188,000 to establish and maintain a Space Theater at the Planetarium. In fiscal 1976 the Foundation pledged a contribution of \$51,350 to be paid over the next five years. Through June 30, 1979, \$44,850 has been received on this pledge.
3. The Management Board of the Planetarium has designated that the net income from special presentations be set aside in a board designated restricted fund to finance current and future improvements and renovations.
4. Pension expense for fiscal 1979 and 1978 was \$30,641 and \$28,721, respectively.
5. The Planetarium receives certain services, including accounting and maintenance services, from the Museum. The aggregate charges for such services in fiscal 1979 and 1978 aggregated \$89,359 and \$86,176, respectively.
6. Grants were received from the Institute of Museum Services ("Institute") in fiscal 1979 and from the New York State Council on the Arts in fiscal 1978, for the purpose of funding the operating deficit. The Institute is a Federal agency in the Department of Health, Education and Welfare, which offers operating and program support to the nation's museums.
7. Depreciation on major plant additions and replacements which have been financed from cash generated by restricted funds is being funded by transfers from restricted funds.

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 Cedric H. Marks—22 trilobites from South

America, 5 large polished limestone
 slabs from Morocco, and 5 slabs of
 matrix containing dinosaur footprints
 Shiro Matsunaga—30 mineral specimens
 Estate of Gordon Nowell-Usticke—
 10,000 mollusk specimens
 Arthur A. Rasch—a 101 carat amber calcite
 from Mexico and a 94 carat cuprite
 from Namibia
 Martin Reiser—27 mineral specimens
 Doris Rubin—67 mounted specimens of
 such animals as pigs, buffalo, deer
 Dr. Randall & Janet Schuh—6,065 insect
 specimens
 Stephen L. Singer—42 oriental works
 Dr. Leo F. Stornelli—3 faceted gems: a
 30.11 carat scapolite, a 25.31 carat
 sphalerite, and a 1.54 carat augelite
 Dr. David Hurst Thomas—a 1971 Ford
 pick-up truck, Model 250
 Jack Zipperman—a 45-pound turquoise
 boulder with an estimated 40,000 carats
 of cuttable rough stones



A Special Message

In keeping with this year's tone set by POMPEII AD79, it might be fitting to discuss the Museum's role in terms of the Roman god Janus. Identified with doors, gates and all beginnings, Janus is shown with two faces, one looking ahead and the other looking back. That's a good way to illustrate the Museum's functions: It provides a look into the past through its collections, ranging from fossils to the special exhibitions such as POMPEII AD79 and the companion Volcano!; at the same time, through its scientific research, the Museum helps us see ahead, opening the gates to better understanding of our world, our universe, ourselves.

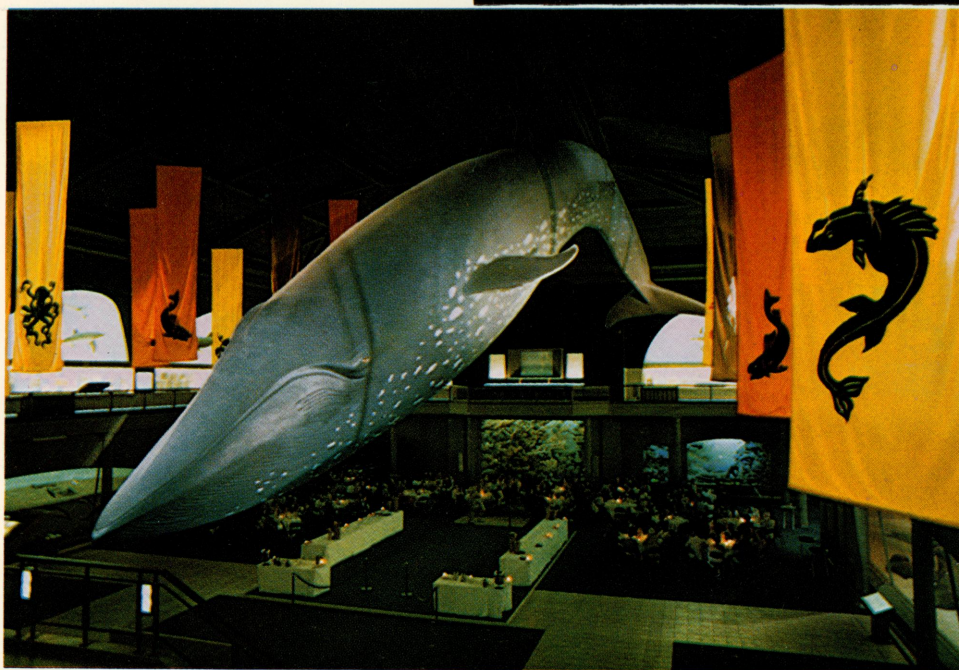
Of course, the present is never neglected. Each year 2,500,000 persons come through our doors and benefit from the Museum's scientific research, exhibition and education efforts.

It is a role the staff takes seriously. To continue to improve these efforts, the Museum relies on your support. All donations are tax deductible.

Those who wish to explore the possibility of making provisions for grants through charitable trusts or through bequests in their wills can further add to the Museum's future. If you would like to discuss the opportunities to support the Museum and its programs, we invite you to contact:

Peter J. Gallagher
Manager for Development
American Museum of Natural History
Central Park West at 79th Street
New York, N.Y. 10024

or call him at:
(212) 873-1300 ext. 546



COVER:

Like an official greeter, the statue of Lucius Mammius Maximus, unearthed at Herculaneum from the volcanic ash of Mt. Vesuvius, bids welcome to visitors to the Museum's successful POMPEII AD79 exhibition. More than a half million Museum-goers, aided by staff facilitators such as this one in her distinctive red tunic, took the fascinating trip back 1900 years. They also visited Volcanol, a special staff-created exhibition exploring the forces that released the destruction which completely buried the cities of Pompeii and Herculaneum on August 24-25, 79 A.D.

ABOVE: Improvements to the Hall of Ocean Life provided much-needed banquet space for Pompeii-related events, and will continue to be used for Museum social affairs.



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