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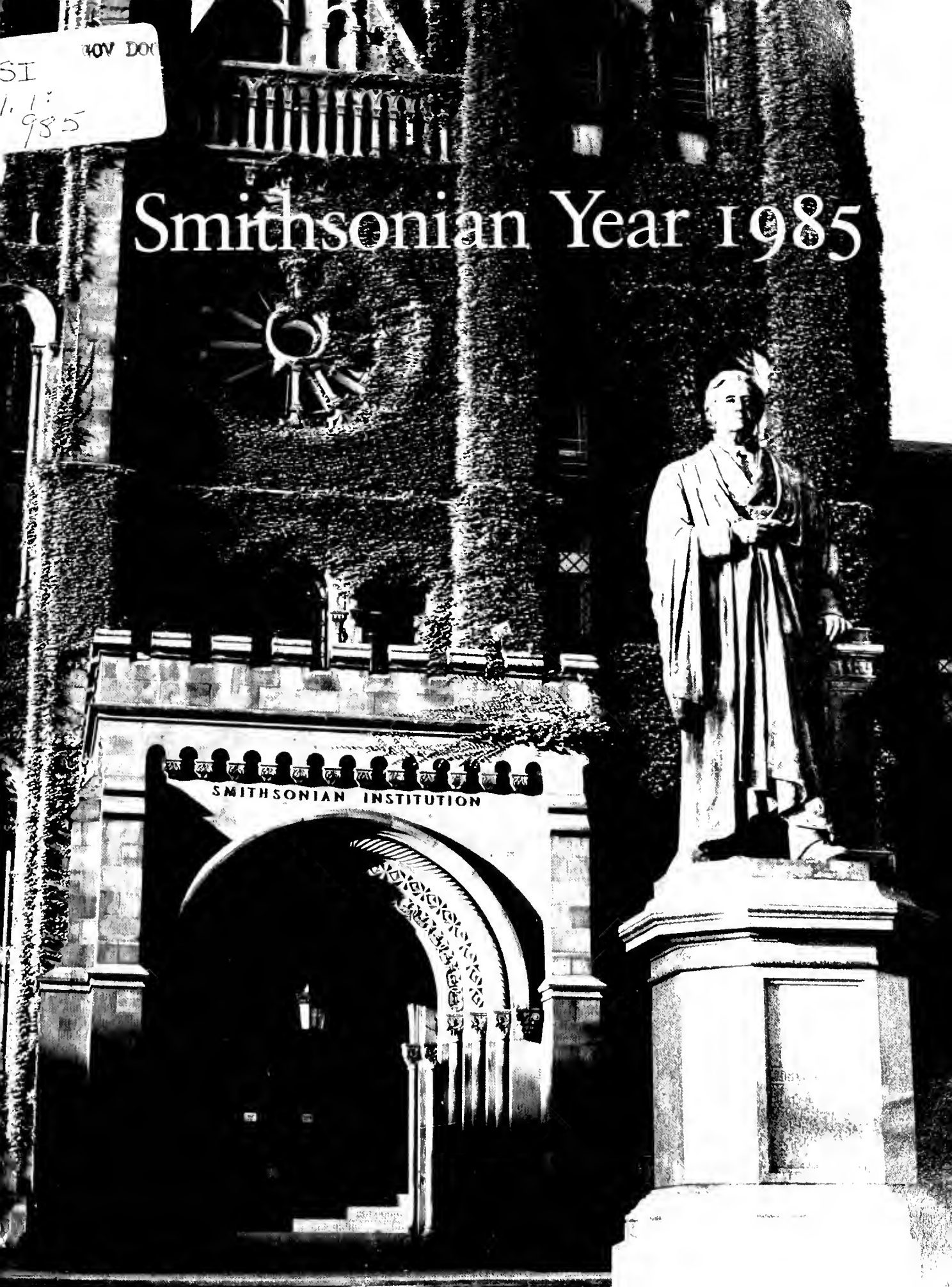


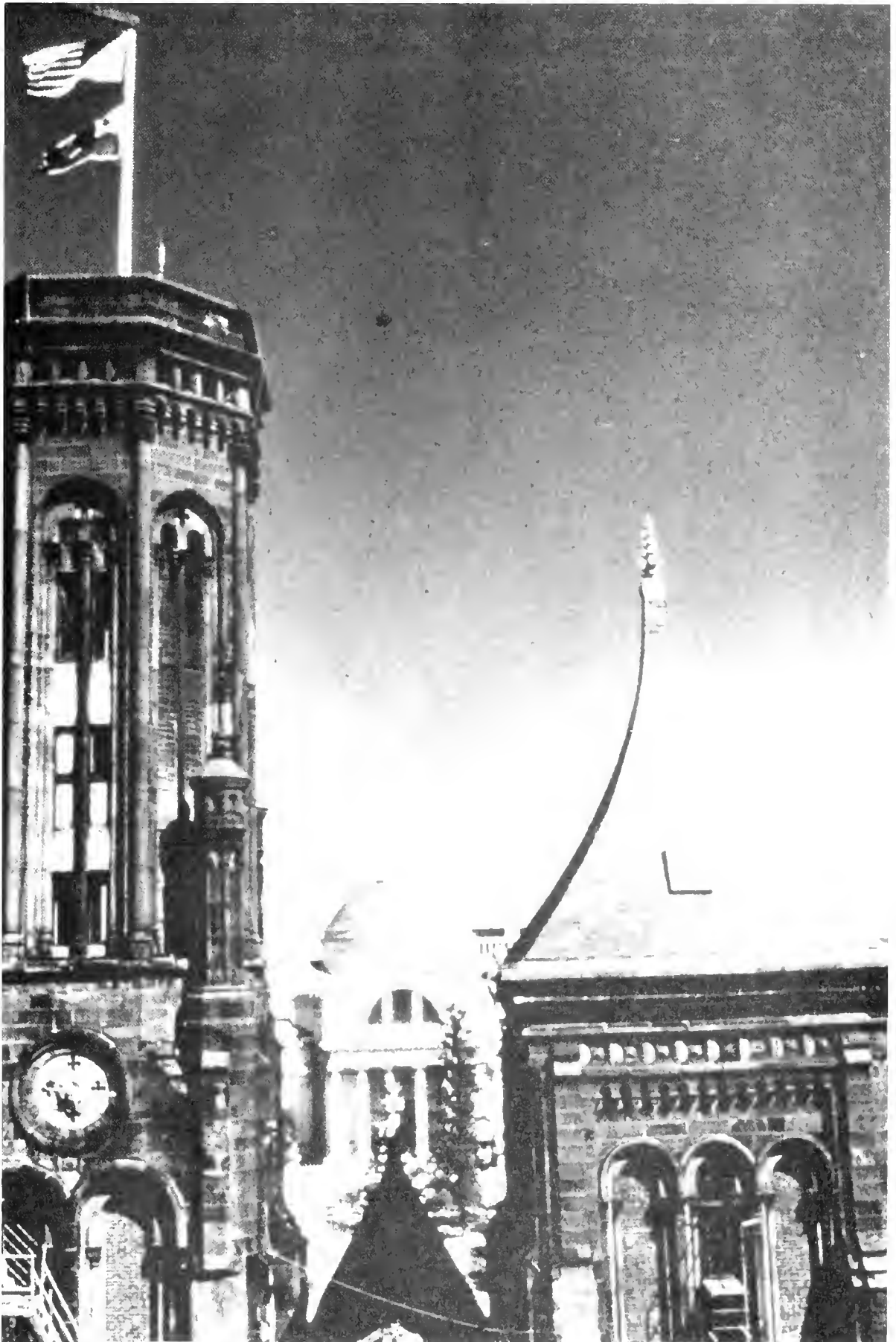


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Smithsonian Year 1985





National Museum of Natural History, as viewed between the Castle (*left*) and the Arts and Industries Building.

Smithsonian Year 1985

Annual Report of the Smithsonian Institution For the Year Ended September 30, 1985



Shah Tahmasp Reading, a drawing by Mir Sayyid Ali, Iran, Tabriz, circa 1530–1540, is among the works of Islamic art in the Vever Collection, an enormously significant acquisition by the Smithsonian Institution for the Arthur M. Sackler Gallery.

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THE SMITHSONIAN INSTITUTION

The Smithsonian Institution was created by act of Congress in 1846 in accordance with the terms of the will of James Smithson of England, who in 1826 bequeathed his property to the United States of America "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." After receiving the property and accepting the trust, Congress incorporated the Institution in an "establishment," whose statutory members are the President, the Vice President, the Chief Justice, and the heads of the executive departments, and vested responsibility for administering the trust in the Smithsonian Board of Regents.

The Establishment

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George H. W. Bush, Vice President of the United States
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George P. Shultz, Secretary of State
James A. Baker III, Secretary of the Treasury
Caspar W. Weinberger, Secretary of Defense
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John R. Block, Secretary of Agriculture
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Samuel C. Johnson
Carlisle H. Humelsine (Chairman)

The Secretary

Robert McCormick Adams

Dean W. Anderson, Under Secretary and Acting Assistant Secretary for History and Art
David Challinor, Assistant Secretary for Science
Joseph Coudon, Special Assistant to the Secretary
Margaret C. Gaynor, Congressional Liaison
James M. Hobbins, Executive Assistant to the Secretary
John F. Jameson, Assistant Secretary for Administration
Ann R. Leven, Treasurer
Peter G. Powers, General Counsel
John E. Reinhardt, Director, Directorate of International Activities
William N. Richards, Acting Assistant Secretary for Museum Programs
Ralph C. Rinzler, Assistant Secretary for Public Service
James McK. Symington, Director, Office of Membership and Development

Statement by the Secretary

Robert McC. Adams

In our own time a tide of progressively greater complexity has carried us very far indeed into an almost endless archipelago of specialization. Most scholars and scientists have become accustomed to living professionally on very small islands, content with some knowledge of a few neighboring islands and with only a very small scale and approximate sense of what may lie beyond. But the narrowing range of individual adventurousness and expertise—contrasting with the vast geographic extensions that are almost routinely possible in our movements—is a relatively recent phenomenon. Quite different conditions prevailed not only during the Renaissance and earlier, were reaffirmed in the Enlightenment, and substantially outlasted the age of Jefferson.

Large-scale, quasi-industrial production of new knowledge was perhaps the key objective in this reduction of intellectual range and intensified emphasis on specialization. Great museum and research laboratory complexes like the Smithsonian, not to speak of our major universities, have become its major embodiment. Through them there has been an ongoing transformation in both our understanding of and our control over the conditions of our existence.

There is no reason to cast doubt upon this marvellously self-generating expansion in our horizons of directed thought and action. Prolonged, devoted specialization has proved to be a necessary condition for most aspects of scholarly and scientific advance. But just as we have gained from the coexistence of a variety of institutional forms, we should resist lockstep uniformity in a march toward specialization. There is nothing whatever to gain from excesses that go beyond bringing the necessary resources to bear on particular problems, maintaining institutional and disciplinary barriers for their own sake. On the contrary, greater effort should be devoted to themes that crosscut or transcend our usual disciplinary and institutional structures.

Alfred Kroeber long ago noted that creative achievements have tended to occur in historic clusterings, extending simultaneously into literary, philosophical, scientific, technological, and artistic realms. That argues for the importance of mutual stimulation among those responsible for them, as well as for the broadly encouraging influence of a supportive social context. Further contradicting the idea of an inexorable growth in specialization, at least some of these clusterings were also characterized by widened horizons of individual accomplishment.

The first great impulse toward specialization could well be one example. Marked by the birth of cities, the introduction of writing, a burst of technical virtuosity in the

crafts, and the state-supported growth of priestly and bureaucratic cadres, it was a time for which our knowledge of individuals is admittedly very limited. One of them was Imhotep, minister to an Egyptian pharaoh during the initial flowering of Old Kingdom civilization. His reputation for numinous powers was joined much later with that of the Greek god Asclepius, still our patron of medicine. Imhotep's long recitation of his impressive administrative titles and achievements was followed with two other skills or attributes: carpenter and sculptor. The association is strange to modern eyes, but surely reflects qualifications or accomplishments that in his time were reckoned to belong together. Such breadth later disappears from Egyptian records.

Thales of Miletus, at the outset of the next great creative burst of which we are aware, is another such example. Noted as a philosopher and mathematician, he was also a practical statesman and navigator. Reportedly he foretold an eclipse (perhaps with the aid of a Babylonian astronomical table), and was a sufficiently canny speculator to have cornered the olive oil market. In contrast with earlier centuries of prevailing anonymity, numerous Greeks like Thales left a permanent stamp as recognizable individuals whose creativity affected everything around them. In being the first substantial group to sign or otherwise take or be given credit for their own works, they display a concern for their place in and contribution to the stream of recorded time and achievement. "A sense of history" is, of course, Greek in its first general appearance.

The historian Carlo Cipolla has sketched a vital, if little understood, medieval transition that bridged the long passage from late antiquity to the Renaissance. It involves the cult of the saints, which cloaked the changing bounds of human aspiration in religious metaphor. This, he believes, contributed to slowly emerging but in the end decisive differences between the two eras:

The saints did not take their ease in the hieratic immobility of the oriental holymen, nor did they amuse themselves like the Greek gods by punishing men for their audacity. On the contrary, they were always at work to overcome the adverse forces of nature: they defeated diseases, calmed stormy seas, saved the harvests from storms and locusts, softened the fall for whoever leapt into a ravine, stopped fires, made the drowning float, and guided ships in danger. The saints practiced what the commoners dreamed: they harnessed nature and, far from being condemned for doing so, they lived pleasantly in Paradise in the company of God. Harnessing nature was not regarded as a sin; it was a miracle.

The next great cluster coincided with the general uncoiling of energies at the outset of the Renaissance. Once again the technical, the scientific, and the artistic joined, or at least overlapped, in ways that for modern tastes are disconcerting: Leonardo, the “divine” Michelangelo, Copernicus, Galileo. There was intense interest in the crafts on the part of the founders of the Royal Society. Yet this was not merely a cyclical return of the earlier pattern. Prefigured by the cult of the saints, essentially human artifices now appeared as a kind of Gestalt for the universe itself. Cipolla, David Landes, and others have written of the obsession of many major Renaissance figures with machinery, and especially with clockwork. Johannes Kepler, for example, expressed it as his aim “to show that the celestial machine is not to be likened to a divine organism but rather to a clockwork,” and Robert Boyle, too, directly likened the universe to “a great piece of clockwork.”

I need not recount later such clusterings. The intervals separating them grew shorter and shorter, and of course more and more is known of the individuals in them. At least in the case of science and technology, transformative contributions in a succession of different fields may have become so numerous that they form an almost uninterrupted series. But in the meantime, what had been during those earlier creative bursts a closely linked and mutually informing set of traditions, spanning all knowledge and creative endeavor, dispersed itself into separate compartments that devote little effort to communicating with or reinforcing one another. Representative, major figures like an Einstein, an Edison, and a Picasso clearly would have had little to say to one another already by the beginning of the twentieth century.

At a deeper level, however, it is not at all clear that creativity itself has had to take fundamentally different forms as fields have diversified and become isolated from one another. To be sure, some historians of science like Thomas Khun hold that processes of scientific discovery are unique, distinctively different from achievements in the arts or, perhaps, even in technology. But an at least equally plausible case can be made that neither the methods nor the intellectual and physical products of the sciences and the arts can truly be distinguished from one another. And at least until the last generation or two, there were major features of the underlying support systems that were largely held in common by the sciences and the humanities.

Private patronage, for example, remained a vital element until fairly recently. It had taken new forms during the Renaissance. Princely families or clerical institutions of

great wealth supported men of learning or artistic achievement in their retinues. No doubt they were at least partly promoting their own social and political objectives, but the course they chose also discouraged the mutual isolation of specialists from one another and promoted new and broader forms of interaction. Gradually patronage evolved further still, the drawbacks of personal dependency without recourse being steadily moderated as greatly enlarged landed and entrepreneurial elites joined the ranks of potential patrons. In most advanced countries the state itself presently created specialized, semi-detached organs to distribute a derived form of patronage more equitably and widely. International as well as national markets for creative works of many kinds simultaneously assumed greater and greater prominence, as did corporate sponsorship. Above all, there arose more or less perpetually endowed and hence relatively independent institutions capable of providing support, detachment, facilities, the stimulus of students and colleagues, and the assurances of continuity on which planning for life-long careers could be premised.

But let me return to an earlier stage in this process. There is a little-noticed difference between our usage of the word, science, and French *science*, German *Wissenschaft*, Russian *nauka*, or the original Latin *scientia*. All the latter are vastly more inclusive, embracing all knowledge. Why is English different?

During the Middle Ages, and even later, the English word had the same broad connotation. The seven (liberal) sciences then were often used synonymously with the seven liberal arts to cover all the formally constituted fields of learning: grammar, logic, rhetoric, arithmetic, music, geometry, and astronomy. Music and mathematics were still “these sciences” in Shakespeare’s *Taming of the Shrew*. Only later, in the seventeenth century, did a contradistinction of science from art begin to emerge, separating theoretical truths and conscious, systematic applications of principles from traditional rules or skills that were applied by habit. Later still, well into the eighteenth century, science first came to designate a branch of study resting on an integrated body of observed regularities. And only toward the end of the nineteenth century did the modern tendency to apply the term especially to the natural sciences make its appearance.

Robert McC. Adams, Secretary of the Smithsonian Institution
(Photograph by Chad Slattery)



This late and slow path of divergence suggests that the seventeenth century was a kind of watershed, a break in what until then had been a common pattern that, once begun, tended to widen further. Much attention has been devoted by historians to essentially the same watershed. In my reading of that work, a sense of tension or mutual antipathy between two major groups of scholars and intellectuals is apparent, perhaps more widely and strongly felt in England than elsewhere in Europe. On one side were those involved in traditional fields of learning that we now would recognize as the humanities. On the other were the epochal figures we now regard as responsible for the birth of the natural sciences in their modern form. But as is shown convincingly by Charles Webster's demonstration of the generality of the idea of a rebirth of knowledge permitting man's dominion over nature, and by Barbara Shapiro's somewhat similar work on the simultaneous appearance of new distinctions between probability and certainty in science, history, religion, law, and literature, the lines were by no means so clear at the time. Allied with the natural scientists, or natural philosophers as they were then known, were far greater numbers of people whom today we would not regard as scientists at all. These were practical men concerned with improving education, surveying, husbandry, economic and monetary theory, and, not least, the reformation of the church.

The real differences were not so much between science and the humanities as subject matter, as between attitudes and personal commitments. The Baconians argued for not merely the mutability but the transformation of knowledge through consciously applied human agency. Today we may be puzzled at the enormous, and in some respects clearly diversionary if not counterproductive, influence of Bacon's unwavering empiricism, of his demand for "minds washed clean from opinion to study [nature] in purity and integrity." But in its time it symbolized the strong and widespread hostility that had developed toward the received and static corpus of classical learning that still held much of humanistic scholarship in its grip.

There is no such mutual antipathy today, but the indifference that has replaced it may be almost as damaging. Science, it seems reasonable to conclude, and even to celebrate, is the driving intellectual if not social force of our age. Its content, to be sure, is not readily comprehensible with the traditional equipment of the humanist. But the natural sciences are by no means as monolithic and impenetrable as humanists too often assume. Moreover, the striking growth of the history of science as a discipline has shown that, viewed as an alternate career path rather than a short-term project, a measure of scientific specialization

can be an attractive challenge rather than a permanent deterrent to at least some humanists.

Within the sciences themselves, the diversity is huge. There is, as is well known, the timeless, elegant parsimony of fundamental particle physics. But there are also inherently complex, descriptive sciences such as systematic biology. Others, like meteorology, are only beginning to attain a useful level of long-range predictability. Still others are currently undergoing real but narrow breakthroughs. These may unify our understanding of limited sets of phenomena, but they leave regularities and rough empiricism coexisting in an uneasy equilibrium. Of the striking advance in plate tectonics over the last two decades or so, for example, Frank Richter has written that

It is only approximately true, not equally applicable everywhere, and not capable of being modified so as to account for those regions where it fails. It contains no reference to the laws of motion even though it describes motion. Yet it is scientific and revolutionary in that it provides a whole new framework for discussing, and in some cases resolving, problems involving large-scale geological processes.

Too commonly, physics is taken as the paradigmatic case for all the sciences. This leads to a "Two Cultures"-like sense of resignation over the apparent hopelessness of the polar opposition between the humanities and science as an undifferentiated whole, rather than to a more positive recognition of the many continuities that exist. Here is Stephen Jay Gould, an evolutionary biologist (and member of the Smithsonian Council) in whose approach one would hope humanists could identify important commonalities on the subject:

The Nobel prizes focus on quantitative, nonhistorical, deductively oriented fields with their methodology of perturbation by experiment and establishment of repeatable chains of relatively simple cause and effect. An entire set of disciplines, different though equal in scope and status, but often subjected to ridicule because they do not follow this pathway of "hard" science, is thereby ignored: the historical sciences, treating immensely complex and nonrepeatable events and therefore eschewing prediction while seeking explanation for what has happened, and using the methods of observation and comparison.

There are, in short, complementarities in approach and outlook between important parts of the sciences and the

humanities, complementarities of which humanists cannot afford to remain ignorant. Similarly, there is a growing amount of suggestive work focusing on the creative process; on the cognitive and symbolic aspects of pattern recognition and discovery; on the intellectual and social organization of disciplines; on the blurring of disciplinary boundaries; and on the history of development of fields as disparate as science and art. Such work persuasively calls attention to these continuities. To what extent, then, are humanists and scientists really breeds apart? Should it not be the mission of the humanities to embrace and interpret the world, and our place in it, as even its scientific dimensions impinge on the human condition, rather than to claim and defend any exclusive territory?

In an earlier age of comparably extraordinary scientific advance, Locke rubbed shoulders with Newton, Hooke, and Boyle in the Royal Society. Bacon, although he energized the great experimentalists of those days, was essentially a philosopher. In our times, I have the impression that there is significantly greater willingness on the part of scientists to reach out into and explore the humanities than one can find among their humanistic counterparts to bridge existing disjunctions from the opposite direction.

My point is to urge the importance of averting the drift into a defensive and exclusionary pattern of thought on the part of those especially concerned with the arts and humanities. This is not to deny that the humanities may indeed be in some jeopardy and need defending. But they will be better served by bold and ecumenical forays directed at new challenges and problems, disregarding all the usual boundaries and addressing the humanistic implications of all knowledge, than by pulling up the drawbridges and narrowly defending the received structures of the past.

My own perspective has been largely shaped by long association with a research university, where my collegial ties were divided between the humanities and the social sciences. Having left that setting for the Smithsonian not much more than a year ago, I am particularly conscious of the differences in programmatic content as well as form that I now find are associated with public museums. Most obvious, particularly in contrast with the spirit of public involvement that surrounds the Smithsonian, is the fact that universities form an encapsulating and protective society of their own. Colleagues communicate with their peers elsewhere, within a limited and self-selected, if often geographically dispersed, sphere of discourse that—especially in the case of the humanities—often provides the greater part of its critics as well as audience. Public museums, by

contrast, must relate to a wider constituency whose demands, and whose access, involve no common acceptance of the principles governing membership in university communities.

There are, of course, many instances in which museums and universities are directly combined into a single institution. But when they are, I believe the relationship always tends to be asymmetrical. Museums are subordinated to universities, rather than vice versa. Further, universities do not set aside resources for great, general museums but only for smaller, more specialized ones. To be sure, the best of them—the University Museum of the University of Pennsylvania, for example—maintain some degree of formal autonomy of program. But since the senior curatorial staffs are largely or completely composed of members of the parent university faculty, the objectives such museums serve are largely those of the traditional academic disciplines. They are primarily handmaidens of scholarly inquiry, in other words, rather than instruments of either research or education in their own right. Such a characterization is not pejorative. But it does suggest that most university-affiliated museums are best considered as adjuncts of universities rather than as representative of museums more generally.

So let us turn instead to some of the characteristics that distinguish public museums as a class. As befits the year in which we celebrate the 75th anniversary of the National Museum of Natural History, I will first concentrate on the field of natural history and later move on to history and the arts.

Because the quality of systematics research depends to a considerable extent on the size of the collections that are available, natural history museums have tended to give primary attention to collections and their management, and to be correspondingly less involved with laboratory-based or theoretical studies. They do traditionally emphasize, and their structure encourages, working in the field—the living laboratory—primarily with observational but increasingly also with manipulative studies. But it is probably fair to say that their primary concerns are to describe and conserve, rather than to test or manipulate.

Museum collections, and the exhibits representing them, have many of the qualities of capital investments. Prudently assembled, they can almost endlessly repay further study from viewpoints beyond the imagination of those initially responsible for them. But such prudence can seldom be indefinitely maintained. And even if it were, the sheer mass of a major collection (much of it usually still awaiting detailed study) tends to freeze curatorial attention within preexisting molds. The comprehensiveness of a

collection, while greatly enhancing its importance as a base for diversified research, therefore also has the potentially perverse effect of slowing or distorting responses to newly opened fields of knowledge.

Most museum departments in the life sciences still have descriptive titles reflecting the basic principles of organization of their collections, basically subdivisions of botany and zoology. In universities such titles have largely disappeared or become specialized, subordinate components of integrated departments of biology. The shift in university practice reflects the truly transformative changes in biology over the past generation or so that have stemmed preponderantly from molecular, genetic, and cellular discoveries, or from health-related research in such fields as immunology, endocrinology, and neurology. The museum contribution to this work has been secondary, and is likely to remain so. Somewhat detached from what is currently the mainstream of biological discovery by their continuing emphasis on the study of whole organisms, natural history museums risk becoming narrow and derivative in their coverage. Essentially the same applies to the museum preference for retaining older, more descriptive field designations such as mineral sciences and geology. The dominant trend among university departments in that domain of science today is, I believe, toward a more unified treatment of atmospheres, oceans, and the internal circulatory movements of the earth itself under the heading of geophysical sciences.

Museums, since they are collections-based, need not and usually cannot pursue the goal of relatively balanced strength that characterizes universities. True, there are some more-or-less "natural" units, of which Natural History and perhaps Modern Art are examples. Within these, bodies of method, theory, and data are so widely shared that real eminence may be difficult to achieve on a narrower basis. But contrariwise, a single museum with anything approaching the universalistic aspirations of at least a few great universities is an impossibility. The Smithsonian goes as far in this direction as any institution in the world, but, significantly, it can do so only by loosely linking together no less than fourteen highly diverse, physically as well as professionally distinct units.

In spite of this unparalleled degree of aggregation, by the standards of our major universities there are significant areas which even the Smithsonian must largely ignore. Laboratory-based subjects in the sciences, such as physics and chemistry, do not lend themselves easily to exhibition and are outside its purview. More generally, fields in which the primary language of communication is mathematical receive little attention at the Smithsonian since

they are difficult to communicate to visitors lacking specialized training. But there are equally significant gaps in the humanities and social sciences.

Material objects in museum collections do not encourage us to do full justice, for example, to political, economic, and intellectual themes. Equally obvious is the dominance in the construction of museum programs of a materialist collections orientation, as distinguished from a humanistic perspective concentrating on written records and forms of creative expression. Apart from the work of its archaeologists and art historians, there are also substantive restrictions on the Smithsonian's coverage that exclude much of the world and the entire pre-modern era. Such restrictions in focus are reasonable as well as unavoidable, given that they occur in what are typically areas of university strength. But it is important not to lose sight of these differences, and to highlight the complementarities of function that they make possible. An important opportunity for the Smithsonian in that respect is to facilitate a wider intermingling of the activities of museum professionals with those of the faculties—and postdoctoral staffs and graduate student bodies—of a number of universities.

Excessive specialization is a further danger that museums must work to overcome. Once again, it is closely tied to the prevailing concentration by museum curators on their collections. Inhibiting a fruitful clash of views, of the kind ideally associated with graduate university seminars, is the necessity for a fairly close identification of a museum specialist with his or her own component of a museum's collections. In addition, there is a discreteness to object-based studies that sometimes deters those involved in them from the discovery, or even the application, of overarching theory. This intensifies the relative isolation of museum curators from their university faculty counterparts. And some isolation is already a result of museums' preoccupation with issues of systematics and typology that have largely disappeared from university curricula.

The foregoing considerations have been largely negative. They distinguish public museums from universities rather sharply. They also would seem to diminish the range of museums' potential contributions to the advance of knowledge, and to delay the response within museums to new ideas. Are museums in fact as constrained in their creativeness and capacities for fundamental research as this suggests? This is certainly not the case! The reason is that there are a host of other, decidedly more positive considerations that create more diversified challenges and opportu-



Paleobiologist Dr. Robert J. Emry places a fossil log under a mounted skeleton of *Hyracotherium*, the earliest known ancestor of the modern horse, in the Museum of Natural History's new exhibition *Mammals in the Limelight*.

nities for museum staffs, and that place the overall contrast with universities in a generally more favorable light.

To begin with, the broad, self-selected character of a museum's audience somewhat counterbalances the narrowing effects of concentrating on specialized collections. Visitors' questions, not to speak of the prior need to make exhibits intelligible, encourage a dialogue reaching far beyond the stratified circles to which most academic faculties confine themselves. Museum exhibits, let me emphasize, need not be frozen and didactic. They can genuinely

involve at least some members of the public in their improvement and even in their initial design. At their most unconventional and innovative, as in the San Francisco Exploratorium (I wish I could cite a humanistic parallel!), they can even involve exciting voyages of quasi-research discovery that transform the understanding of those creating them as much as those viewing them.

Furthermore, museums have gratifying opportunities to respond to national needs and problems that are beyond the reach of universities. Museums, for example, must not only accommodate to but creatively interpret intensified

demands for public participation, and for a decentralization of society permitting a multitude of individual choices. With a quarter of the annual increase in our population now being a product of massively renewed immigration, their exhibits must somehow reflect the reemergence of cultural pluralism. Museums also offer opportunities, unknown in universities, to contribute to a rediscovery of literacy, in all its forms, at a time when our school systems are faltering at this task. A major new initiative that the Smithsonian has undertaken jointly with the National Academy of Sciences—the creation of a National Science Resources Center—takes direct advantage of such opportunities.

Turning to research in museums, it has a number of positive aspects that are less obvious—but no less important—than the somewhat negative ones I have mentioned. Work in universities is typically tied to the relatively narrow tolerances and priorities of the peer review systems of the national foundations, institutes, and endowments; that in museums is significantly less so. Hence museums are particularly suitable as a base for long-term or high-risk research projects. The necessarily delayed or uncertain payoffs of such projects cannot correspond to the restrictive terms of granting cycles. They aim instead at slowly cumulative increases in knowledge, or at going beyond safe bets to test unpopular ideas that, if correct, would have important consequences. I am proud to include the Smithsonian among the museums that at times have quite consciously taken this latter approach.

Similarly, while a preoccupation with systematics and descriptive approaches may lead to isolation and corresponding theoretical weakness, natural history museums have a matching strength: modern ecological problems underscore the need for more, not less, systematics. Take what can only be described as an approaching world crisis of tropical deforestation, a subject with which we plan to deal in a forum jointly sponsored with the National Academy of Sciences and in a later exhibition in our soon-to-be-opened Quadrangle. These forests are biologically the richest of the earth's environments. A proliferation of species is now being found in them that far exceeds earlier estimates. As a result, we may need to alter evolutionary views concentrating on the differential survival of variably endowed individuals within a species, and to give greater emphasis to processes of inter-species competition. But fundamental to any such research effort must be a securely established basis of species identification, classification, and relationships. Sociobiologist E. O. Wilson has made the point eloquently:

If systematics is an indispensable handmaiden of other branches of research, it is also a fountainhead of discoveries and new ideas, providing the remedy for what the biologist and philosopher William Morton Wheeler once called the dry rot of academic biology. Systematics has never been given enough credit for this second, vital role. Every time I walk into a fresh habitat, whether tropical forest, grassland, or desert, I become quickly aware of the potential created by a knowledge of classification. If a biologist can identify only a limited number of species, he is likely to gravitate toward them and end up on well-trodden ground; the remainder of the species remain a confusing jungle. But if he is well-trained in the classification of the organisms encountered, his opportunities multiply. The known facts of natural history become an open book, patterns of adaptation fall into place, and previously unknown phenomena offer themselves conspicuously. By proceeding in this opportunistic fashion, the biologist might strike a new form of animal communication, a previously unsuspected mode of root symbiosis, or a relation between certain species that permits a definitive test of a competition theory. The irony of the situation is that successful research then gets labeled as ecology, physiology, or almost anything else but its fons et origo, the study of diversity.

I observed earlier that museum collections may sometimes represent a source of undesirable inertia. But they remain a precious resource for science which must be nurtured and maintained. Our knowledge of the natural world derives in large measure from studies of the collections. As new insights and technologies are developed, collections are reexamined and more information is gleaned. Hence, we should not think of collections as stagnant, but rather as dynamic assemblages of the natural world which grow in value over time. The Smithsonian's collection of egg shells, for example, has been crucial to understanding the impact of pesticides on the size, growth rates, and sustainable population of birds, while our fish collection, which dates from the 1880s, has provided important evidence on significantly higher concentrations of methyl mercury in fish already by the 1970s.

Solutions to the problems of Third World countries also are often dependent on museum collections. Such problems often include excessive population growth and consequent stress on the resource base, accompanied by depletion of soil nutrients, deforestation, and the decline of genetic diversity in crop and forest reserves. It is difficult for any of these complex and interlocking issues to be addressed without a more detailed knowledge of the envi-

ronment. Increasingly, that must include a detailed account of native faunas and floras, for which only the collections of the great natural history museums can provide the needed standards for comparison.

Turning from museum potentialities in the life sciences, let us consider a case midway along the continuum between natural history and the arts. Anthropology and archaeology collections offer different but equally interesting possibilities. Evolving standards and traditions of inquiry are leading us away from concentrating on the formal, macroscopically observable properties of individual objects. The science moves instead toward the internal properties, contexts, and associations of objects in collections—features that may never be evident to the casual museum visitor. Context, in particular, is of critical importance. This explains why archaeologists have taken leadership in efforts to prevent the illicit international movement and sale of antiquities, since that traffic, by its nature, conceals or destroys information on context.

Scholarly advance in this area involves steadily improving precision in recording and interpreting temporal and spatial associations and modes of deposition or preservation. Manufacturing debris may be at least as important as the object itself. A used and broken specimen may permit dimensions of understanding that a perfect, unused one cannot. A poor copy or duplicate, of little interest to an art historian, may provide vital clues to the ways in which commodities were produced and circulated. Physico-chemical analysis can reveal sources of raw materials, modes of preparation, and patterns of use. All of these details are frankly more significant as scholarly objectives than the display of the object itself. Exhibits become correspondingly more difficult to explain and mount, and attention shifts from individual works of art or craftsmanship to the representation of entire social systems in large, carefully sampled collections of which little will ever go on exhibit.

Particularly distinguishing both history and art museums are exhibits or collections that are not simply representatives of larger classes but may have symbolic functions or properties of their own. The Smithsonian's massive participation in the Festival of India—eighteen of our bureaus were directly involved—is a case in point. In no way could the rich texture of India itself be adequately represented. Some would argue that the path we took slighted its history and diversity, as well as the dynamism of its modern centers of urban integration. But the marvelous vitality of the *Aditi* exhibition, in particular, conveyed an even more significant message of its own.

Symbolic properties always present special challenges.

How can curators deal responsibly with objects that are, in effect, icons, regarded as precious or freighted with contemporary meaning by their viewers, respecting and enhancing the significance they have for many, while at the same time studying them dispassionately as scholars? Can they encourage viewers to distinguish contemporary from original meanings by the ways in which objects are displayed in exhibits suggestive of their wider social and historical contexts? Museum-associated historians and historians of art can face challenges of this kind that are fully as subtle and intellectually demanding as those accepted by their university-associated counterparts.

In speaking of icons I am not referring solely to individual objects of great public veneration, such as the Star-Spangled Banner that is briefly uncovered in the Smithsonian every hour to the playing of our national anthem. The symbolic associations of whole collections can more or less consciously be used for didactic ends, as Barbara Clark Smith of our National Museum of American History has recently argued. Take the case of the decorative arts and crafts, which were rather self-consciously "Americanized" in the early decades of this century at a time when a mass influx of immigrants may have seemed to threaten established traditions here. At first, the resultant focus was typically on beautiful objects in their own right, inculcating the aesthetic standards and values of native American elites, without regard for what may have been representative or in common use.

In the 1950s the emphasis shifted, as in our own exhibition entitled *Everyday Life in the American Past*. But the image then sought was of an idealized average or middle class, without reference to the range of variation characteristic of the society itself. As the initial proposal for that exhibition put it, "When the visitor leaves he will have in his own mind's eye a clear impression of what the average American . . . held as his obtainable ideal." Shifting yet further in the 1970s and 1980s, historians are now projecting—our just-opened exhibition *After the Revolution* is an example—a more comprehensive picture of the condition of life of the whole society, with the internal stresses, conflicting values, and diversity that have always been part of it.

To carry out this latest interpretive task with collections as the basis—to make the transition from material objects to an understanding of deeper and more generalized patterns of social, cultural, and intellectual history—is not only difficult in itself but almost certainly leads to altered interpretations. It is fully comparable, in other words, to a new and creative research product. But for a public museum the underlying objective is no different from ear-

lier ones. All of the successive orientations of museum exhibitions concerned with history to which I have referred necessarily proceeded from one value position or another: a particular interpretation of history, or an assertion of the priorities of particular historians. Such positions then enter the arena of public debate. And they do so more directly, risking or benefiting more from the resultant public response, than if the same interpretations were propounded within the better insulated setting of a university.

There is a feature of many public museums of the arts that seems to distinguish them not merely from universities but even from museums in university settings. As exemplified by our Cooper-Hewitt Museum, the National Museum of Design, they are more likely not to confine themselves rigorously to the fine arts but to range into the decorative arts, the crafts, and the field of design. In so doing they create a new vision of unity that links creative accomplishments with the wider world that supports and hopes to utilize them. Why they should have assumed this mantle of leadership is unclear, although I can hazard a possible explanation.

Critic Meyer Abrams argues that the bifurcation between art and design is surprisingly recent, culminating only with the publication of Immanuel Kant's *Critique of Aesthetic Judgment* in 1790. Prior to that, from the time of the Classical Greeks onward, theorists had assumed the maker's stance toward a work of art, regarding it as a thing made, an *opus*, according to a *techne* or *ars*, that is a craft, each with its requisite skills. This was, in Abrams' terms, a "construction model"—a work designed to attain certain external ends: to have an emotional or instructional effect on a particular audience, or in a particular social, religious, or other setting.

In the latter part of the eighteenth century, Abrams maintains, such a stance was replaced by a "contemplation model," consistent with the growth of a substantial leisure class that included among its symbols of status the refinement of a nonutilitarian aesthetic culture and the prestige of connoisseurship. This model treated the products of all the fine arts as ready-made things existing simply for the rapt attention of viewers, who were wholly divorced from the world of the artist or from the world of any intended use.

Is it possible that the narrower definition prevails in universities, because they are more tightly bound to the disciplines of art history and art criticism by their responsibility for training scholars in these disciplines—in fact, by the encapsulating academic society that I mentioned earlier? Museums may be staffed by some of those trained scholars, but they differ in being more subject to the pull

of a public demand that is not cognizant of the restraints imposed by the traditional boundaries of academic disciplines. Public art museums have fewer restraints, and thus are able to range more widely, to be more experimental, or to specialize in new and more unconventional ways. May we continue to take advantage of those opportunities!

I return, in conclusion, to my underlying concern with the enhancement of continuities. There is no denying that we live in a climate of shrunken expectations and lengthening postponements. Is talk of enhancing anything merely empty rhetoric under the circumstances? I think not, although concededly, as an archaeologist and culture historian, I may be more tolerant than most about progress that can only be measured across static generations or even epochs. Timing imperatives almost always seem more urgent in prospect than in retrospect. Good ideas need not die if not immediately put into effect. Holding determinedly to a long-term view and thinking specifically of the Smithsonian (although with an eye on more widely prevailing needs and opportunities as well) what should be our goals?

Further growth for its own sake is neither possible nor especially desirable, although it may occur as a by-product. Substantial further growth could well have a predominantly negative effect, by increasing our fixed commitments and hence restricting our vital freedom of action. At least in our research, that freedom—to pursue new leads, to see and exploit new connectivities, to test and find wanting one approach and go on, zealously and without hesitation or regret, to develop a better one—is one of the goals that is most precious to us.

A second goal is to facilitate our own engagement in, and contribution to, the widest possible discourse. Institutions have natural boundaries in some respects, imposed by their programs, budgets, traditions, staff expertise, and the like. But it is important not to accept those boundaries uncritically and then to overgeneralize about their applicability, permanence, and significance. The proper place for the Smithsonian's programs, in other words, is not kept to themselves within a rigid, preexisting structure, but in the widest and closest possible interaction with all their actual and potential counterparts.

Third and finally, I have touched at numerous points on the notion of discovering and reinforcing new complementarities—between fields of specialization, between internally generated projects and the needs and perceptions of the wider society, and between the increase and the diffusion of knowledge. Hence it is appropriate to



Young visitors are introduced to a chinchilla during the Meet-a-Mammal education program at the Zoo's Small Mammal House.

use as an illustration and encouragement, for the arts and humanities as well as for the sciences, an example drawn from the history of physics. Werner Heisenberg's "uncertainty principle," formulated in 1927, established that in the then new and revolutionary world of quantum physics one could determine the position of an orbiting electron, or its velocity. But the two quantities could not be determined simultaneously. The very process of measuring either position or velocity altered the other entity so that both could never be known with certainty. It is a dilemma with analogies or resonances that are familiar to humanists, such as the distorting role of the observer of human actions, or the foreclosure that a widely circulated interpretation may impose on precise future recurrences of the past pattern of human thought or behavior to which it referred.

The solution to this dilemma was also propounded by a physicist, Niels Bohr. He called his insight "complementarity," and it was as much philosophy as it was physics. In

essence, Bohr said, the position of a particle might be considered "complementary" to knowledge of its velocity. By knowing both with the greatest possible accuracy, a more complete description of experience, a new synthesis, was possible. Complementarity was stated in other ways by Bohr in his efforts to explain the new physics. Think of complementarity, he said, in terms of two ideals that may seem mutually exclusive—for example, justice and compassion. Taken together, Bohr pointed out, they complement one another to create a larger truth.

The humanities and the sciences are, in my view, complementary in just the sense that Niels Bohr suggested. And it should be our goal to make the Smithsonian Institution a place where these activities not only coexist but work together to create a larger truth.

Staff Changes

For an institution of such size, diversity, and complexity, the Smithsonian has had remarkably few changes in its top staff over the last year. But the significance of these changes will nonetheless be apparent to all who know the Institution well.

The retirement of Under Secretary Phillip Samuel Hughes is a case in point. At his own insistence and with great reluctance, we let Sam retire quietly, without fanfare, on an inconspicuous Friday afternoon in early June. What slipped from our midst was a rare example of public service at its best. Though his five years at the Smithsonian were but a few crowning an exceptional career in public administration in and around the federal government, his presence will be gratefully recalled throughout the Smithsonian for years to come. At the same time, we were fortunate to have among our cadre Dean Anderson, a man of extraordinary vision and accomplishment who from the first has proven an effective successor to Sam as Under Secretary.

Several other important staff changes were made quite early in my first year at the Smithsonian. To meet the needs of the Institution in its conduct of international activities, we were again fortunate to be able to recruit from among our own number John Reinhardt, who assumed a new high-level position as Director of International Activities. A former ambassador and State Department official, as well as former acting director of the National Museum of African Art and Assistant Secretary for History and Art, John brings a wealth of experience to this vital area of Smithsonian interests. Another major appointment came to fruition with the arrival early this year of James Demetrian as Director of the Hirshhorn Museum and Sculpture Garden. Jim is off to a highly productive beginning which is likely to be of lasting significance to the museum and the Institution.

Several key departures include Richard Fiske, former Director of the National Museum of Natural History and now a full-time volcanologist there; Jon Yellin, former Director of Programming and Budget and now Assistant Director for Administration at the Woodrow Wilson Center; Nathan Reingold, founding editor of the Papers of Joseph Henry and now Senior Historian at the National Museum of American History; and Ken Shaw, Director of the Office of Plant Services, who retired after almost eleven years of highly effective service. While these and other dedicated administrators will be missed, we are fortunate to be able to count on their continuing involvement in the work of the Institution in new capacities.

The staff of the Smithsonian is its backbone: its vitality, uniqueness, and strength. To all of them I owe an extraordinary debt of gratitude for having supported me in my first year as Secretary.

The Year in Review

For the Smithsonian Institution, fiscal 1985 was a year of enrichment of the national collections, celebration of cultural diversity, and achievement in research, exhibition, and construction.

Additions to the collections of scientific specimens, works of art, and cultural artifacts held in the name of the American people numbered more than half a million items during the year. Most of the new objects became part of the study collections; a few were displayed in ongoing exhibits or in one of the year's 100 new exhibitions, to be enjoyed by the members of the public who paid an estimated 22.7 million visits to Smithsonian museums during the year.

The briefest survey of the variety of these objects attests to the scope of Smithsonian research and areas of responsibility.

The Entomology collection at the National Museum of Natural History was strengthened by the new Brodzinsky Collection—rare pieces of amber containing plant and insect fossils, some 24 million years old, which are both objects of beauty and sources of scientific information.

The museum also acquired the Small/Nicolay collection of more than 100,000 butterflies from North and South America, including many species that previously were not represented in the Smithsonian's collection, as well as many species new to scientists.

At the National Museum of American History, one newly acquired item of true historical significance was the Bradford cup, a rare silver wine goblet made in 1634, which belonged to William Bradford, governor of Plymouth Colony.

On a more contemporary note, the museum's Political History division was busy in early 1985 cataloging presidential campaign memorabilia—buttons, banners, badges, and bumper stickers—gathered during the 1984 Democratic and Republican conventions.

The museum also added one of the earliest Isaac Singer sewing machines and one of the original Xerox copier machines to its collections.

The National Air and Space Museum acquired the suit and helmet worn by Senator Jake Garn of Utah on his Discovery shuttle flight, a Soviet SAM-2 missile, tires from the

space shuttle Columbia, and memorabilia from former astronaut—and former Smithsonian Under Secretary—Michael Collins, including the operations checklist Collins used on the Apollo II lunar landing mission in 1969.

Among the additions to the collections of the National Museum of American Art were 459 paintings of American Indians by George Catlin, transferred from the National Museum of Natural History.

The National Portrait Gallery's Print Department became the custodian of a rare broadside offering \$100,000 for the capture of Lincoln's assassin, John Wilkes Booth. There were few such "WANTED" signs posted because Booth and his accomplices were caught twelve days after the assassination.

Every birth at the National Zoo adds to the collection, but there are also additions to the living inventory from outside sources, among them this year an Indian rhinoceros, an endangered Cuban crocodile, and a female giraffe from Africa.

Among the many generous gifts and the carefully considered purchases during the year, three in particular stood out as treasures of human creativity.

In one case, there was drama in the act of acquisition. It was a fortuitous meeting between Smithsonian curators and a private collector of Islamic and Persian paintings and manuscripts which led to an addition to the national collections that is perhaps the most significant purchase in the Institution's history.

The very existence of the Vever Collection, which has been acquired for the Arthur M. Sackler Gallery, a new museum of Asian and Near Eastern art scheduled to open to the public in 1987, had been the subject of continual speculation among scholars for more than forty years.

This unparalleled treasury of artwork, much of it by the leading artists of their times, was assembled between 1900 and 1943 by Henri Vever, a prominent jeweler in Paris. The collection provides a comprehensive survey of the art of the Persian book and is composed of 39 full manuscripts, 291 separate miniatures, 98 calligraphies and illuminations, 29 bookbindings, and 4 textiles. Much of the Vever Collection, which includes examples of almost all the great classical Persian texts, as well as several important Arabic works, has never before been exhibited.

With the national collections now comprising the Islamic paintings in the Freer Gallery of Art, generally acknowledged to be the finest grouping in North America, and the Vever Collection, which is larger than the Freer's and of comparable quality, the Smithsonian takes its place as a major world center for the study and exhibition of

Islamic manuscripts.

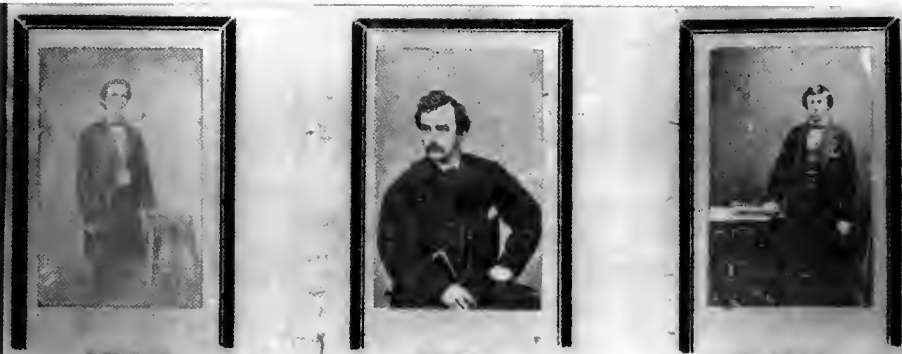
The Vever Collection was purchased through a combination of Smithsonian trust funds and private contributions, including a generous contribution from Dr. Arthur M. Sackler, donor of the Sackler Gallery. In addition, Dr. Sackler was instrumental in negotiating the acquisition of the collection.

Meanwhile, the National Museum of African Art was in the process of acquiring a major collection of African art objects. Assembled over the years by a private European collector, these works range in date from the twelfth century to the mid-twentieth century. They originate from several sub-Saharan regions, with particularly fine representations from Central Africa. Twelve of the pieces are unique in their own categories; they are celebrated in the corpus of African Art known today and have accordingly been exhibited and reproduced in publications repeatedly throughout the world. The objects are of exceptional aesthetic quality, and their presence will elevate the museum's holdings into the mainstream of museum collections of African art in the United States.

The National Museum of American Art received a unique gift from the Container Corporation of America: 311 paintings, sculptures, drawings, and collages, modern works commissioned by Container Corporation and reproduced in the institutional advertising programs inaugurated by the company in 1937. Most of these works were commissioned for the Great Ideas series, in which artists interpreted the writings of the world's great thinkers. The collection is both a documentation of a corporation's role in the cultural life of the United States for nearly fifty years and a repository of many distinguished works by major artists of the twentieth century.

The year was also notable for three important milestones in the history of a multifaceted institution which has the privilege of celebrating the accomplishments of the past while anticipating the challenges of the near and distant future.

On October 4, 1984, the Hirshhorn Museum and Sculpture Garden celebrated the tenth anniversary of its opening. The museum, established through a gift by the late Joseph Hirshhorn of his entire collection of 6,000 modern sculptures, paintings, and works on paper to the United States in 1966, embarks on its second decade immeasur-



SURRAT.

BOOTH.

HAROLD.

War Department, Washington, April 20, 1865,



\$100,000 REWARD!

THE MURDERER

Of our late beloved President, Abraham Lincoln,
IS STILL AT LARGE.

\$50,000 REWARD

Will be paid by this Department for his apprehension, in addition to any reward offered by Municipal Authorities or State Executives.

\$25,000 REWARD

Will be paid for the apprehension of JOHN H SURRATT, one of Booth's Accomplices.

\$25,000 REWARD

Will be paid for the apprehension of David C. Harold, another of Booth's accomplices.

LIBERAL REWARDS will be paid for any information that shall conduce to the arrest of either of the above-named criminals, or their accomplices.

All persons harboring or secreting the said persons, or either of them, or aiding or assisting their concealment or escape, will be treated as accomplices in the murder of the President and the attempted assassination of the Secretary of State, and shall be subject to trial before a Military Commission and the punishment of DEATH.

Let the stain of innocent blood be removed from the land by the arrest and punishment of the murderers.

All good citizens are exhorted to aid public justice on this occasion. Every man should consider his own conscience charged with this solemn duty, and rest neither night nor day until it be accomplished.

EDWIN M. STANTON, Secretary of War.

DESCRIPTIONS.—BOOTH is Five Feet 7 or 8 inches high, slender build, high forehead, black hair, black eyes, and wears a heavy black moustache.

JOHN H. SURRAT is about 5 feet 9 inches. Hair rather thin and dark; eyes rather light, no beard. Would weigh 145 or 150 pounds. Complexion rather pale and clear, with color in his cheeks. Wore light clothes of fine quality. Shoulders square; cheek bones rather prominent; chin narrow; ears projecting at the top; forehead rather low and square, but broad. Parts his hair on the right side; neck rather long. His lips are firmly set. A slim man.

DAVID C. HAROLD is five feet six inches high, hair dark, eyes dark, eyebrows rather heavy, full face, nose short, hand short and fleshy, feet small, instep high, round bodied, naturally quick and active, slightly closes his eyes when looking at a person.

NOTICE. In addition to the above, State and other authorities have offered rewards amounting to almost one thousand dollars, making an aggregate of about **TWO HUNDRED THOUSAND DOLLARS.**

A rare broadside offering a reward for the capture of Lincoln's assassin, John Wilkes Booth, and his accomplices. Albumen silver print, mounted on printed broadside, 1865. National Portrait Gallery.

ably enriched by Mr. Hirshhorn's generous bequest of 5,500 additional art works.

In March 1985, the National Museum of Natural History celebrated the 75th anniversary of the opening of the present building with a series of special events, including Diamond Jubilee birthday parties for Smithsonian staff and for visitors; an exhibition of ninety historic photographs entitled *The Natural History Building, A Visual Memoir*; the installation of two permanent natural sculptures, a massive iron-ore boulder, and an arrangement of petrified logs, at the Mall entrance; an illustrated scholarly history; souvenir booklets and posters, and the first pictorial staff directory.

The Resident Associate Program celebrated its 20th anniversary in the fall of 1985 with a rich program of films, courses, tours, lectures, and special events suited to the program's dedication to the principle of lifelong education and its pioneering role in the development of the concept that museums can be effective vehicles for education from childhood to the golden years. Since the program's hesitant first steps two decades ago, its membership has grown from 1,522 to a healthy 56,000, representing a total of 130,000 people. With the help of growing public support, the program has evolved from a few modest efforts to its present offering of some 2,000 activities a year. Last year, a total of 270,000 people passed through one or another of the Institution's doors to participate actively in the life of the Smithsonian through the Resident Associate Program.

The year was also marked by President Reagan's presentation of the Medal of Freedom, the nation's highest civilian award, to Smithsonian Secretary Emeritus S. Dillon Ripley, whose twenty-year tenure as the Institution's eighth secretary broadened and extended the Smithsonian's services in the fields of science, history, exposition, publication, education, research, public service, community activities, conservation, and the performing as well as the visual arts and brought into being several new units and museums, including the Hirshhorn Museum and the Smithsonian Associates.

The Festival of India 1985-1986 opened in Washington, D.C., in June 1985. This celebration of Indian culture in the United States is bringing art, music, drama, dance, film, and crafts to major cultural institutions across the United States, depicting the variety and richness of modern India as well as the continuity of 5,000 years of cultural

tradition and heritage.

The Festival, which originated with an agreement between the late Indian Prime Minister Mrs. Indira Gandhi and President Reagan in 1982, is an important landmark in Indo-U.S. relations, forging better bridges of understanding between the peoples of the world's two largest democracies.

Eighteen Smithsonian bureaus have become involved in planning and producing exhibits, programs, and events specially designed for the Smithsonian's program for the Festival of India 1985-1986. Secretary Emeritus Ripley is American chairman for the Festival.

The Smithsonian's first exhibition for the Festival, *The Arts of South Asia* at the Freer Gallery of Art, assembled some seventy masterpieces of painting and sculpture representing a complete survey of the Freer's holdings from the Indian subcontinent, spanning the period from the second century B.C. through the eighteenth century. It was the largest showing of Indian painting and sculpture in the Freer's history.

Aditi: A Celebration of Life, a unique living exhibition originally created in New Delhi in 1978 for the Year of the Child, transformed the National Museum of Natural History's Special Exhibits Gallery into a rural Indian setting where visitors not only saw artifacts associated with the stages of life, but also were treated to live performances, demonstrations, and rituals, all designed to reveal the traditional world of the Indian child. More than 125,000 visitors, including Indian Prime Minister Rajiv Gandhi and first lady Nancy Reagan, viewed the exhibition during its eight-week-long stay.

For two weeks during the summer, the nineteenth annual Festival of American Folklife, produced by the Smithsonian's Office of Folklife Programs, brought the National Mall alive with the sights, sounds, tastes, smells, and textures of an Indian *mela*, or fair, with seventy participants from India, including street performers such as acrobats, jugglers, and animal and human impersonators; booth operators such as fortunetellers, garland makers, and improvisational photographers; musicians, folk dancers, and ritual artisans.

A remarkable feature of both *Aditi* and *Mela! An Indian Fair* was the response of Smithsonian friends and the Washington community at large to the Institution's need for extra help. In addition to the time dedicated by staff members, 134 volunteer translators, docents, and helpers gave 8,500 hours to *Aditi*, and 125 volunteers spent 5,000 hours on the *mela*, helping with everything from hospitality to construction work.

At the National Museum of Natural History, two exhi-



Indian folk artist Ganga Devi demonstrates the techniques of Mithila wall painting in the *Aditi* exhibition. Depictions of divine lovers Radha and Krishna grace the walls of traditional nuptial chambers in her home village.

bitions of photographs offered contrasting views of India, past and present. *Rosalind Solomon: India* consisted of thirty-nine photographs taken in India by American photographer Rosalind Solomon from 1981 to 1984; *Images of India: Photographs by Lala Deen Dayal* presented twenty-one photographs by India's most accomplished nineteenth-century photographer, documenting not only architectural monuments but also the changing world of Indian princes under the British Raj.

Panorama of India, at the National Museum of American History, drew on the collections of the Smithsonian Libraries to assemble books, prints, and a manuscript documenting early European voyages and travels in India, accounts of British officials who served in India, and the influence of Indian art motifs on European designs and tastes.

The Office of Smithsonian Symposia and Seminars sponsored "The Canvas of Culture: Rediscovery of the

Past as Adaptation for the Future," a symposium in which participants from India and the United States explored critical questions of loss, continuity, and change as they apply to interrelated aspects of Indian life: folk traditions, contemporary fine arts and letters, religion and ritual, women and the family, the natural and built environment, and science and technology.

The Smithsonian Resident Associate Program joined in with a schedule of courses, seminars, workshops, tours, films, and performing arts events, for adults and young people, in conjunction with the Festival of India, and the National Associate Travel Program offered tours to wildlife sanctuaries in India and Nepal.

Radio Smithsonian, the Institution's nationally broadcast weekly radio program, offered features on scientific research in India as well as cultural and historical topics.

The Smithsonian News Service, which distributes monthly packages of feature stories to more than 1,500

daily and weekly newspapers across the United States, issued a special edition of features focusing on aspects of India today.

Several publications will result from the Institution's involvement with the Festival of India 1985-1986. The Smithsonian Institution Press has already given us *Aditi: The Living Arts of India*, a look at life in India through the world of the child, with numerous essays by India experts, written on the occasion of the exhibition, *Aditi: A Celebration of Life*.

The spirit of international cooperation and exchange embodied in an event like the Festival of India 1985-1986 has long been a part of the Smithsonian's mission. This spirit continues to grow and find expression in ongoing Smithsonian activities and in our plans for the future.

The Woodrow Wilson International Center for Scholars increasingly provides opportunities for American and foreign scholars to meet and share ideas. From late September 1984 to May 1985, the Center organized five major conferences on "The United States, Britain, and Europe: Changed Relationships in a Changing World," alternating the venue between the Wilson Center and Ditchley Park, Oxford. Culminating the fiscal year was a three-day conference on "Spain in the 1980s: The Domestic Transition and a Changing International Role," which examined Spain's decade-long transition to parliamentary democracy and its significance, especially from the point of view of Latin American nations.

At the invitation of the Ministry of Culture of Pakistan, the Smithsonian's Office of Museum Programs sent staff to Islamabad and Karachi to conduct two three-day workshops on "Preventive Care of Collections" for 50 participants from museums and archives in Lahore, Peshawar, Hyderabad, Moenjodaro, Islamabad, and Karachi. Eighty-six of the 123 participants in Museum Programs' Visiting Professionals Program came to the Smithsonian from museums and related organizations in Africa, Asia, Europe, Central and South America.

Among the highlights of the Smithsonian Institution Traveling Exhibition Service's busy schedule for the year was *Ebla to Damascus: Art and Archaeology of Ancient Syria*, an exhibition of 281 objects representing 10,000 years of history. The exhibition, organized by SITES and the Directorate General of Antiquities, Syrian Arab Republic, marks the first time that antiquities from Syria have been shown in North America.

The Smithsonian National Associate Lecture and Seminar Program offered its first International Program this

year. Ten Smithsonian speakers journeyed to Tokyo for this significant event.

The concrete and steel evidence of the Smithsonian's commitment to the idea of international scholarly and cultural exchange was plain to see as the construction of the massive Quadrangle project behind the Castle neared completion. The three-level underground facility will house the Center for African, Near Eastern, and Asian Cultures as well as public space and offices for the Smithsonian National and Resident Associate programs and the Smithsonian Institution Traveling Exhibition Service.

The three major components of the Center are the Arthur M. Sackler Gallery, the National Museum of African Art, and the International Center.

The International Center will explore ancient and evolving cultures of the non-Western world and serve as the Smithsonian's headquarters for Latin American scholarship, exhibitions, and programs. The Center will sponsor major exhibitions, which will be displayed in the International Gallery for periods of nine months to a year. The inaugural exhibition will be a unique multi-disciplinary investigation of the art and rituals associated with birth, from ancient times to the present. The Center will also conduct scholarly seminars, conferences, and symposia and organize public programs, including lectures, films, performances, and demonstrations, on themes related to the exhibitions.

The International Center is administered by the Directorate of International Activities, which was established in October 1984. In addition to planning for the move into the Quadrangle, International Activities staff are preparing for the Smithsonian's commemoration of the 500th anniversary of Columbus's 1492 landfall.

The Sackler Gallery and the Freer Gallery of Art together comprise the Center for Asian Art. As construction of the Sackler Gallery's basic structure neared completion, staff members were busy refining plans for the design and furnishing of exhibition galleries, the museum shop, collection storage, and the library. Plans are simultaneously being made for renovation of the Freer Gallery following the relocation of the library and offices to the Sackler building.

The National Museum of African Art's preparations for the move from Capitol Hill have included a vigorous campaign to recruit and train docents. A generous grant from The Morris and Gwendolyn Cafritz Foundation has made possible the planning and preparation for the major inaugural loan exhibition in the Quadrangle, *African Art and*



A Yoruba (Nigeria) ivory female figure on an oval-shaped base, wearing a cone-shaped headdress, necklace, hip ornaments, and bracelets, and holding a flywisk in one hand, was acquired by the National Museum of African Art with the generous support of the James Smithsonian Society. (Photograph by Ken Heinen)

the Cycle of Life.

The public's interest in African art was illustrated by the fact that more than 14,000 visitors came to the National Museum of African Art in its present inadequate home on Capitol Hill to view *African Masterpieces from the Musée de l'Homme* during the exhibition's nine-week stay. This major display of 100 world-renowned works of art from West and Central Africa, drawn from one of the foremost collections of African art in the world, was presented under the patronage of the Ambassador of the Republic of France to the United States and organized by The Center for African Art, New York.

For the first time, the National Museum of African Art was able to make its collection and research facilities available for advanced scholarly research through the Smithsonian's Office of Fellowships and Grants. This was made possible by a three-year grant from the Rockefeller Foundation Residency Program in the Humanities allowing \$150,000 for postdoctoral research in residence at the museums in the areas of African art history and anthropology, especially material culture, and in Asian art history for research in the collections on topics that may initiate scholarly symposia, exhibitions, and other major museum activities.

The grant will provide two to three postdoctoral appointments at the National Museum of African Art and the Center for Asian Art each year beginning in 1985 and continuing through 1988. The Smithsonian's first fellow under this program is studying the role of African women as placemakers and the arts and architectures of nomadism in Africa.

And the Smithsonian's Office of Horticulture has been preparing to put the crowning touch on the Quadrangle with the planning of a 174,240-square-foot garden covering the site, the fruit of a \$3 million gift from philanthropist Enid Haupt.

The building of the Quadrangle project may have been the most visible construction here this year, but it was certainly not the only growth in progress at the Smithsonian, which has been adding to its resources and achievements in research, exhibition, publication, and education in the scientific disciplines, history, and the arts.

The Archives of American Art opened a new center, its sixth, in November 1984. The Southern California Research Center, located at the Huntington Library in San Marino, California, will serve the Pacific Southwest.

The Museum Support Center in Suitland, Maryland, marked a historic moment on December 13, 1984, when

the first artifact—a jar filled with Pacific Halibut plankton specimens—was placed on a shelf. It will be followed by millions of objects and specimens from Smithsonian collections.

At the National Museum of American History, the first of the museum's major reinstallations neared completion. *After the Revolution: Everyday Life in America, 1780–1800*, opening in November 1985, explores the lives of ordinary people who lived in America in the final two decades of the eighteenth century. The permanent exhibition and its accompanying publications, educational materials, and public programs are the fruits of several years of research and planning.

While work continued on the new facility for the Anacostia Neighborhood Museum, scheduled to open in March 1986, the museum presented its last exhibition in the renovated movie house that has served as its home since the mid-1960s. *The Renaissance: Black Arts of the '20s* takes visitors back to the period known as the Harlem Renaissance, which saw an explosion of black creative expression in literature, music, and the arts in Washington, Philadelphia, and other cities as well as in the Harlem district of New York.

The National Museum of American Art offered its visitors a look at the breadth of American artists' creativity with an exhibition program that included *Sharing Traditions: Five Black Artists in Nineteenth-Century America*, *Creation and Renewal: Views of Cotopaxi by Frederic Edwin Church* and, at the museum's Renwick Gallery, *The Woven and Graphic Art of Anni Albers*.

The Hirshhorn Museum and Sculpture Garden entered its second decade with public programs and exhibitions that included two very important shows with international scope. *Representation Abroad* focused on the strength and diversity of representational works by sixteen artists working in Australia, Colombia, France, Great Britain, Italy, Spain, and West Germany. *A New Romanticism: 16 Artists from Italy* was a major loan exhibition focusing on a romantic, spiritual impulse in recent Italian art.

Among the many exhibitions at the Cooper-Hewitt Museum, the Smithsonian's National Museum of Design in New York City, were *Celebration and Ceremony: Design in the Service of Wine*, spanning the globe and thirty-five centuries, and *Art Pottery: A New Vista in American Ceramics*, now being circulated by the Smithsonian Institution Traveling Exhibition Service.

At the National Portrait Gallery, the joint exhibitions *A Truthful Likeness: Chester Harding and His Portraits* and *William Edward West: 1788–1857, Kentucky Painter* reexamined the work of two neglected mid-nineteenth century

artists, and a show of the work of Mexican artist Miguel Covarrubias delighted visitors with the witty caricatures that entertained readers of the *New Yorker* and *Vanity Fair* beginning in the 1920s.

A survey of notable scientific achievements at the Smithsonian this year takes the reader from the ocean depths to outer space.

In December 1984, two National Museum of Natural History botanists reported the identification of the deepest plant found on Earth, an alga they discovered during a four-hour submersible dive off an uncharted seamount in the Bahamas. The scientists said that the abundance of this plant at previously unknown depths requires a rethinking of the role of macroalgae in ocean ecology, opening up a whole new realm of oceanography.

At the natural history museum, a microcosm of a Maine coastal ecosystem, housed in a 3,000-gallon aquarium simulating natural conditions, joined the living coral-reef model on display. The twin exhibits, developed by the Smithsonian Marine Systems Laboratory, offer a classic example of the interplay of scientific research and public education at the Smithsonian.

Other research at the National Museum of Natural History included continued exploration of a remote Venezuelan mesa and coral atolls in the Indian Ocean. In addition, museum scientists discovered evidence that eastern North American Indians were farming long before the introduction of maize from Mexico, examined erosion of the Nile Delta, addressed issues of conservation in the forests of Kenya, and began the expansion of a volcanological data bank.

The year also saw the completion of a ten-year study of a bat population by a National Museum of Natural History biologist at the Smithsonian Tropical Research Institute (STRI) in Panama.

This was a landmark year for STRI. The government of Panama extended to the Institute the prerogatives and benefits that correspond to status as an International Mission. STRI received a \$4 million grant from the Earl Silas Tupper Foundation to construct a new research center. STRI and the University of Panama's Center for Marine Sciences and Limnology gave the first intensive graduate field course in Marine Ecology to be offered at the University. In addition, two uninhabited and virtually undisturbed Pacific islands off the Pacific coast of western Panama were donated to STRI through the Nature Conservancy's International Program. These islands, donated by Jean Neimeier of Poulsbo, Washington, in memory of her hus-

band, Edward, have become living laboratories for scientists studying native birds, vegetation, and iguanas.

Ongoing research at STRI included a pioneering study of tropical tree diversity and population dynamics; studies of the green iguana, a threatened species that is an important traditional source of protein for people throughout much of Latin America; research into the impact of Africanized honeybees on native fauna, and investigation of the evolutionary and ecological consequences of the mass mortality devastating populations of one species of sea urchin, *Diadema antillarum*, throughout the Caribbean.

The Smithsonian Environmental Research Center (SERC) in Maryland pursued important, long-term research in the areas of regulatory biology, environmental biology, and radiocarbon dating. New insights were gained into the structure and function of polypeptides associated with the photosynthetic apparatus of plants. Since August 1984, a high-precision scanning radiometer, developed and built at SERC, has collected data atop Mauna Loa, Hawaii, on ultraviolet light and changes in the ozone layer. Other measurements on solar radiation were collected in Maryland and Panama. At SERC's site in Edgewater, Maryland, scientists continued their studies of the nutrient dynamics in the Chesapeake Bay ecosystem.

The National Zoo proceeded with its program of renovation, redesign, and reconstruction, and completed a new veterinary hospital at its Conservation and Research Center in Front Royal, Virginia. Among the imaginative additions at the Zoo was the extensive planting of specially chosen flowers which are luring masses of butterflies to the Zoo.

There were over 350 births and hatchings at the Zoo, many of them vital to international breeding programs for endangered species and a tribute to the Zoo's research in this field. Asian lions were added to the collections as part of a cooperative breeding program, and the Zoo placed two female North American bison on display as symbols of the contributions of zoos to conservation. The Zoo continued its program of releasing the progeny of one of its most successful breeding programs, the golden-lion tamarins, into the animal's original habitat in Brazil, hoping to augment the dwindling population in the wild.

When Space Shuttle Flight 51 F achieved Earth orbit on July 29, 1985, *Challenger* carried among its complex array of scientific experiments an Infrared Telescope designed and built by the Smithsonian Astrophysical Observatory (SAO) in cooperation with the University of Arizona and the NASA-Marshall Space Flight Center.

SAO astronomers Christine Jones and William Forman were awarded the Bruno Rossi Prize of the High Energy

Astrophysics Division of the American Astronomical Society for their significant contributions to high-energy astrophysics, specifically, their research on hot X-ray emitting coronae around early-type galaxies, which provides further evidence that the so-called missing mass of the universe may be found in the great dark halos surrounding galaxies.

SAO scientists using advanced image-processing techniques to reevaluate the existing map of the universe discovered that some of the supposed distribution of galaxies in strings and filaments was due to errors in the original compilation techniques. They are now in the process of literally changing the map of the universe.

At the National Air and Space Museum, visitors gained the opportunity to ride the space shuttles vicariously through the latest IMAX film, *The Dream is Alive*. This insider's view of America's space shuttle program includes inflight footage shot by astronauts specifically for the film, which is shown on a screen five stories high.

In addition to educating and entertaining visitors, the film, created through the cooperation of the Air and Space Museum, Lockheed Corporation, IMAX Systems Corp., and the National Aeronautics and Space Administration (NASA), is being used by NASA for purposes of design research. By reviewing the footage of astronauts living in the shuttle, NASA engineers may be able to design a better shuttle.

The 1985 restoration of the 1903 Wright Flyer was an important milestone for the museum's Paul E. Garber Preservation, Restoration and Storage Facility.

A new multi-media show, *Comet Quest*, in the Air and Space Museum's planetarium, set the stage for Comet Halley's return in 1986. Additions to major gallery exhibits included *Military Air Transport* and *Dynamic Worlds of Jupiter and Saturn*.

Researchers at Air and Space continued to collect, organize, and translate the finest archive available in the United States of original material relating to Russian aeronautics during the first two decades of the twentieth-century. Work also progressed on the Space Telescope History project, a joint enterprise with the History of Science Department of Johns Hopkins University. Scientific research in terrestrial and planetary geology and remote sensing at the Center for Earth and Planetary Studies including mapping of features on Mars and study of geomorphologic processes in the upper Inland Niger Delta of Mali, including study of desertification as a result of twenty years of drought. This work was expanded to a broader three-year study of three arid regions in Mali, Egypt, and Botswana.

Another major technological achievement was realized in the museum's successful field tests of the System for Digital Display (SDD), a computer-based system with the potential to revolutionize archival storage, inventory, and research. The SDD can permanently store as many as 100,000 images of documents, maps, books, drawings, and three-dimensional artifacts on a single 12-inch optical disk the size of a phonograph record, using a high-resolution digital camera. The permanent, high-quality archival record thus created is easily and rapidly indexed or searched by computer and can be safely transported or shipped. The images may be reproduced on a printer or telephoned to a facsimile machine anywhere in the world. Public and private organizations ranging from county school districts to the FBI have expressed an interest in the system, and the museum has applied for a patent.

The variety and scope of fellowship programs and research opportunities at the Smithsonian continues to grow. In addition to the Rockefeller Residency Program in the Humanities, new programs at the Smithsonian include the Office of Museum Programs' Native American Program for North American Indians, Inuit, Aleut, Canadian Natives, Alaskan Natives, and Native Hawaiians, which in 1985 provided fourteen appointees with research opportunities designed to assist them to interpret and maintain collections in their museums and archives.

The National Air and Space Museum created an International Fellowship and announced the establishment of the Martin Marietta Chair in Space History. The museum's new Office of University Programs co-hosted a cooperative program with New York University on the "History of 20th-Century Technology," an experiment in an innovative course of study integrating museum resources into the university curriculum.

The diversity of research opportunities at the Smithsonian could be seen in the range of the research undertaken by the five Regents' fellows in residence at the Institution during the year. The subjects of their research included historical aspects of African weaving, at the Museum of African Art; placement of the VLBI antenna facility in orbit around the Earth and research on high-energy physics, at the Smithsonian Astrophysical Observatory; research on science and technology artifacts, at the Museum of American History; and study of the biogeography of coral reefs and islands, at the Museum of Natural History.

Publications programs at the Smithsonian produced a vari-

ety of works directed at specialized audiences and the general public.

The Joseph Henry Papers published the fifth volume of the papers of the Smithsonian's first Secretary, documenting the years 1841-43.

At the Museum of African Art, a gift from The Shell Companies Foundation awarded in February 1985 enabled the department to begin a publication series. The first book is titled *The Art of African Kingdoms*.

The Cooper-Hewitt Museum produced a handbook on the rare-book collection and added a unique volume on the design traditions associated with the history of wine, *Wine: Celebration and Ceremony*, to its lengthy bibliography. The museum also received a major grant from the J.M. Kaplan Fund that will serve as seed money for future publications.

The National Air and Space Museum issued the first volume in a new series, *National Air and Space Museum Research Report* (1984).

The Smithsonian Institution Press published the sixth work in the series Smithsonian Studies in Air and Space, *United States Women in Aviation: 1930-1939*. The impressive list of books published by the SI Press this year included *Smithsonian Surprises*, an activity book for children; *Space, Time, Infinity; Mystery of Comets; Miguel Covarrubias Caricatures*, to accompany the National Portrait Gallery exhibition, and *Drawn From Nature: The Botanical Art of Joseph Prestele and His Sons*. *Drawn From Nature* received the prestigious Art Director's Club of New York award as well as the New York Art Critics Award.

With the increase in publishing activities, SI Press stepped up its use of electronic publishing this year, receiving nine manuscripts either by telephone transmission or on computer disks.

The Press's Smithsonian Collection of Recordings division released *American Popular Song: Six Decades of Songwriters and Singers*. The seven-record set comes with a booklet containing an essay on the history of song and the various styles of singing, critical analysis of each performance, and meticulously researched information about the performers, composers, and lyricists. A previous set in the series, *Big Band Jazz: From the Beginnings to the Fifties*, won two Grammy awards.

Report of the Board of Regents

The first meeting of the Board of Regents was held on January 28, 1985, and opened with a tribute to the late Regent William A. M. Burden. The Regents elected Mr. Johnson to membership on the Executive Committee and nominated Mr. Barnabas McHenry of New York as a citizen member of the Board. The Audit and Review Committee reported on its meeting of November 20, 1984, held in the National Museum of American History and at the National Zoo's Conservation and Research Center in Front Royal, Virginia. The Personnel Committee reported that it had reviewed the financial interests statements of the executive staff and had found no conflict of interest whatsoever. Discussing the report of the Investment Policy Committee, the Treasurer agreed to present an analysis of the Smithsonian's investments in businesses operating in the Republic of South Africa.

Secretary Adams initiated a "Secretary's Report," an oral presentation on a variety of topics which were quite tentative or of recent origin as the business of the Institution. After the Treasurer presented reports on the status of federal and trust funds, fiscal years 1984-86, the Regents discussed and approved the *Five-Year Prospectus, Fiscal Years 1986-90*. In other major actions, the Regents voted to proceed with planning, design, and construction of food service facilities on the basis of direct Smithsonian financing and voted to seek authorization for the appropriation of \$11.5 million for one-half of the construction costs of the Cooper-Hewitt Museum's physical expansion. The Board discussed at length the status of the Quadrangle construction and programming, inter-institutional cooperation, legislation, the U.S. Postal Service's possible establishment of a National Postal Museum, the endowment of the George E. Burch Fellowship, the U.S. Patent Model Foundation, and the programs of the Visitor Information and Associates' Reception Center. The Regents also received status reports on equal opportunity and affirmative action, personnel matters, the Museum Support Center and collections management, other major construction projects, a gift for the Smithsonian Tropical Research Institute, the Eastman House Collection, litigation, and television.

The Regents' dinner was held at the Supreme Court on the preceding evening, January 27, in honor of Secretary and Mrs. Adams. The Chancellor officially welcomed the guests, toasted the President, and introduced the Vice President who spoke briefly about the Adamses and offered a toast in their honor. After thanking the Vice President, Mr. Adams conveyed his impressions of the nation's capital and the extent to which the efficiency of official Washington is enhanced by less formal relationships and gatherings such as the Regents' dinners.

The Chancellor called to order the next meeting of the Board of Regents on Monday, May 6, 1985. In their first action, the Regents reviewed recent developments regarding the Smithsonian's efforts to improve museum restaurant facilities and operations and agreed that the Chancellor should appoint an *ad hoc* committee of the Regents to review the subject of Smithsonian restaurant services and the Institution's various options. The Executive Committee reported on its April 10, 1985, meeting and the Audit and Review Committee reported on its March 21 meeting at the National Zoological Park.

In connection with the report of the Investment Policy Committee, the Regents discussed the nature of the Institution's investments in companies doing business in the Republic of South Africa, expressed grave concern regarding South Africa's policy of apartheid, and decided that non-signatories should be queried as to their reasons for not signing the Sullivan Principles. The Treasurer noted that, as instructed by the Investment Policy Committee, the Institution will vote all proxies with special attention to matters pertaining to South Africa and other social issues. The Board of Regents accepted the recommendation of the Investment Policy Committee and approved for fiscal year 1986 a total return income payout rate of 8.27% for the endowment funds.

The Regents received and discussed reports on the 1985 and 1986 appropriated and non-appropriated trust funds. After Mr. Adams gave his Secretary's Report, he announced with regret that Under Secretary Hughes would soon retire, whereupon the Regents unanimously adopted the following Resolution:

Whereas Phillip S. Hughes has imparted unfailingly wise counsel to the Board of Regents of the Smithsonian Institution since 1977:

Whereas Phillip S. Hughes has given of himself unstintingly as Under Secretary of this Institution for over five years; and

Whereas Phillip S. Hughes has brought to the Smithsonian a profound sense of the responsibilities of effective and honorable public administration: Now, therefore, be it

Resolved by the Board of Regents of the Smithsonian Institution, That the Board expresses its gratitude for his manifold and extraordinary services to the Smithsonian Institution and wishes him every happiness in his well-deserved retirement; and be it further

Resolved, That this resolution be embodied in a suitable and permanent record.

Mr. Adams pointed out that with Mr. Hughes' enthusiastic endorsement he had concluded that Dean Anderson is well qualified to assume the responsibilities as Under Secretary, and after discussion with the Regents he announced his intention to appoint Mr. Anderson as Under Secretary upon Mr. Hughes' retirement.

Among other major actions, the Regents approved the purchase of an extraordinary collection of African art assembled over the years by Mr. Emile Deletaille; reappointed Mary Barnes, R. Philip Hanes, Jr., Richard Hunt, Charles Parkhurst, Jean Seth, and Virginia Wright and appointed Sharon Rockefeller to the Commission of the National Museum of American Art; established the National Zoological Park Medal for outstanding services to zoological science and conservation and the National Air and Space Museum Trophy for extraordinary service in air and space science and technology, and accepted the Annual Report of the Secretary for Fiscal Year 1984.

Major reports presented to the Regents covered the Smithsonian Volunteer Program, the potential remodeling and expansion of the Natural History Building, and the Eastman House Collections. The Secretary also gave status reports on the Quadrangle, the Museum Support Center and collections management, other major construction projects, the Patent Model Collection, the 1985 Festival of American Folklife, legislation, litigation, and television and film.

On Sunday evening, May 5, the Chancellor and the Regents were hosts to a dinner in the Castle in honor of members of the National Board of Smithsonian Associates and other high-level donors to the Quadrangle project. After dinner the Chancellor welcomed the guests and the Secretary presented the Founder Medal of the James Smithson Society to Mr. William S. Anderson, a major donor and tireless chairman of the committee of National Board members whose work brought a total of \$3.7 million in contributions toward the Quadrangle.

The Chancellor called the third meeting of the year to order on Monday morning, September 16. The Regents welcomed Mr. McHenry to his first meeting as a Regent and voted to renominate Messrs. Humelsine and Bowen to serve additional terms as members of the Board. The Executive Committee reported on its meeting of August 27 and the Audit and Review Committee reported on its meeting of August 1. It was noted that the Chancellor had appointed Senator Sasser, Messrs. Conte and Mineta, and Regent Emeritus Haskins as the *ad hoc* committee of the Regents to review the subject of Smithsonian restaurant services.

The Investment Policy Committee reported on its special

August 21 meeting to discuss Smithsonian investments in companies doing business in South Africa and the Board of Regents considered the Committee's recommendations. The Regents were unanimous in their personal abhorrence of the system of apartheid in the Republic of South Africa and further agreed that, in the face of a fluid and rapidly changing situation both at home and in South Africa, no formal statement of the Regents would be issued on the Institution's investment policy; that the basic position of the Board was manifested in the action taken by the Executive Committee in June to divest of the Institution's holdings in American companies involved in South Africa who had not subscribed to the Sullivan Principles; that the Secretary be requested to continue to work with the Regents and to prepare materials concerning alternative courses of action, consistent with the Institution's policies and resources, for possible consideration at the Regents' subsequent meeting; and that the Secretary should convey these conclusions to the press following the meeting.

Other major actions by the Regents included the approval of modifications to the 1985 trust fund budget, the 1986 federal and trust fund budgets, and the Institution's 1987 federal budget submission to the Office of Management and Budget, discussion of a draft of the Five-Year Prospectus, Fiscal Years 1987-1991, and Construction Priorities, endorsement of the purposes of legislation authorizing the planning and construction of facilities for the National Air and Space Museum at Dulles Airport, preliminary consideration of a proposal of the Washington Dulles Task Force to construct an interim facility for the Air and Space Museum to exhibit the space shuttle Enterprise at Dulles, approval of the purchase of the Vever Collection of rare Persian art, establishment of the Regents' Publication Program to encourage extraordinary scholarly contributions from the staff, approval in principle for the launching of a new magazine entitled *Air & Space*, and authorization for the redistribution of the Hirshhorn special collections among other Smithsonian museums and the establishment of an endowed acquisition fund for the Hirshhorn Museum. After they appointed Nancy Graves and Myron Kunin to the Commission of the National Museum of American Art and Michael Collins, W. John Kenney, and R. W. B. Lewis to the Commission of the National Portrait Gallery, the Regents reappointed Rosemary Carroon, Joanne duPont, Harmon Goldstone, August Heckscher, Karen Johnson Boyd, Russell Lynes, Kenneth Miller, Amanda Burden, Arthur Ross, Robert Sarnoff, and Marietta Tree to the Cooper-Hewitt Advisory Council.

After Mr. Adams concluded his Secretary's Report, he

Financial Report

Ann R. Leven, Treasurer

discussed the renovation of the Arts and Industries Building and relocation of the Woodrow Wilson International Center for Scholars. He also drew the Regents' attention to status reports on the Smithsonian's international activities, the National Science Resources Center, a planned exhibition on the Information Age, programs for the bicentennial of the Constitution, planning for the 1992 Quincennial, the Quadrangle and other major construction projects, the Museum Support Center storage equipment, the Postal History Museum, personnel matters, legislation, litigation, the Cooper-Hewitt Capital Campaign, and television and film. In addition, the Secretary mentioned the forthcoming annual meeting of the Smithsonian Council and he invited the Regents to attend.

On Sunday evening, September 15, the traditional Regents' Dinner was hosted by the Chancellor and the Board of Regents in the Lerner Room of the Hirshhorn Museum and Sculpture Garden. After dinner Mr. Adams welcomed the Regents and their guests and offered brief remarks about his perceptions of Washington upon the completion of his first year as Secretary. The Chancellor spoke in honor of Senator Daniel Patrick Moynihan and, as voted by the Board of Regents, presented to him the Henry Medal and a citation. Senator Moynihan expressed his gratitude to the Regents for this honor and his appreciation for his affiliation with the Hirshhorn Museum and the Smithsonian. The Ambassador of India, the Honorable K. Shankar Bajpai, moved by the occasion, spoke of his country's great respect and appreciation for the Smithsonian and the Senator.

Fiscal year 1985 was one of transition, selective growth, and financial stability for the Institution. Federal appropriations enabled the Institution to fund budgeted programs and to proceed with needed repairs and renovations to Smithsonian facilities. An increase in trust fund revenues supported new initiatives during Robert McC. Adams' first year as Secretary. The Treasurer's Office itself bustled with activity as fiscal policies came under review, a minor reorganization took place, and new ideas percolated. A dedicated staff made the year one of substantial accomplishment.

Operations

For the fiscal year ending September 30, 1985, the federal government provided \$164,321,000 to fund ongoing operations, an increase of \$7.6 million over the previous year. This additional federal funding provided support for inflationary cost increases and important program initiatives. Incorporated in the congressional action, however, was a two percent reduction applied to each line item in the budget. This across-the-board reduction, combined with the receipt of only partial funding for the costs of legislated pay raises, required the curtailment of purchasing and hiring throughout the Institution, as well as the undesired limitation of summer evening visiting hours.

There has been a great deal of discussion both inside the Institution and by outside parties concerning the percentage of operating support actually provided by federal appropriation versus that provided by the net income available from endowments, museum shop sales, and other revenue-generating trust activities sources. The question is easily answered by the following chart:

Source of Funds	Gross Revenues (In \$1,000s)	Net Income (In \$1,000s)	Net Income %
Federal			
Appropriation	\$164,321	\$164,321	75%
Federal Gr. and			
Contracts	15,653	15,653	7
All Trust			
Sources	<u>157,841</u>	<u>38,480</u>	<u>18</u>
Total Available for			
Operations	\$337,815	\$218,454	100%

Included with this narrative are charts which graphically spell out how Smithsonian funds available for operations were allocated.

Federal appropriations provide the core support for the Institution's continuing programs in research, exhibitions, education, and collections management, including related administrative and support services. Substantial sums go for maintenance and protection of the collections and physical plant. During fiscal year 1985 major new funding was provided for the replacement of scientific equipment; for Quadrangle-related activities of the National Museum of African Art, the Sackler Gallery, and the Libraries; for research activities of the National Museum of Natural History; for exhibition activities at the National Museum of American History, including a program to commemorate the Bicentennial of the Constitution; and for enhanced guardianship and maintenance.

Support from federal agencies in the form of grants and contracts constitutes an important source of research monies for the Institution while also benefiting the granting agencies by providing access to Smithsonian expertise and resources. Sponsored research conducted during fiscal year 1985 included continuing work on the algal turfs and the Caribbean king crab mariculture, systematics of *Aedes* mosquitoes, development of an optical interferometer which will substantially improve the ability to measure the angular position of stars, and development of a community-based science education program.

Income from nonappropriated trust fund sources including gifts, grants, endowments, current investments, and revenue-producing activities allowed the Institution to undertake new ventures and enhance existing programs in a way that might not otherwise have been possible. Notable in this regard was the establishment of a Special Exhibitions program to help support major temporary exhibitions. The highly successful *Aditi* exhibition held in the Evans Gallery of the National Museum of Natural History was one of the first of these specially funded exhibitions. Funding for the Directorate of International Activities, which will coordinate programs for the Smithsonian's new International Center, and for the Council of Overseas Research Centers reflected a new Smithsonian emphasis on international exchange and cooperation.

Two awards programs were significantly augmented by trust funds: Fellowships and Scholarly Studies. The Fellowship program provides stipends to visiting scholars, enabling them to use the collections and resources of the Smithsonian. The Institution's Scholarly Studies program makes grant awards covering research assistance, travel, and special supplies to Smithsonian scientists and scholars

for individual research projects. Research needs were also served when the Institution allocated monies to convert the 24 in.-diameter telescope at the Whipple Observatory at Mt. Hopkins, Arizona, into a 48 in.- diameter telescope.

Smithsonian collections benefited from trust fund availability during fiscal year 1985. Anticipating the opening of the Quadrangle, the National Museum of African Art acquired a notable collection of sixty-one objects, ranging in date from the twelfth to the fifteenth centuries A.D. to the mid-twentieth century. In addition, monies were set aside for the Hirshhorn Museum to purchase contemporary art.

Substantial funds were also made available for computer enhancement, as the Institution continues its efforts to improve administrative efficiency and collections accessibility. It is also instructive to note that trust funds enabled the Smithsonian to assist the Visions Foundation to publish its new magazine of Afro-American culture. The first issue of *American Visions* is scheduled to appear in conjunction with the first Martin Luther King, Jr., national holiday.

Special Foreign Currency Program

Foreign currencies, accumulated primarily from sales of surplus agricultural commodities under Public Law 83-480 and determined by the Treasury Department to be in excess of the current needs of the United States, are made available to the Institution through the Special Foreign Currency appropriation. In fiscal year 1985, the Smithsonian obligated \$9,258,000, equivalent in excess currencies, for scientific work primarily in India but also in Pakistan, Burma, and Guinea. The monies were made available to United States institutions for research and advanced professional training in fields of traditional Smithsonian interests and competence. The reserve for the American Institute of Indian Studies was increased by \$3.9 million, and the third of four planned contributions was made to the international effort to restore and preserve the ancient city of Moenjodaro in Pakistan.

Construction and Plant Funds

Construction of the Quadrangle proceeded on schedule during 1985. During the course of the year, a very large pledge was deemed uncollectable and has been taken as a write-off in the attached statements. This situation is regrettable but will not jeopardize completion of the

project. All other major pledges have been collected or are on a progress payment schedule.

On a more positive financial note, the Smithsonian Tropical Research Institute received a commitment and first payment on a pledge of \$4,000,000 toward the construction of the Earl S. Tupper Research and Conference Center. Named after the father of the donor, the long-needed building will provide conference space and updated research facilities for the Institute.

Perhaps the biggest surprise of the year came when the Institution put up for auction the gaily decorated yellow 1966 Rolls Royce once used by the Beatles. A donation to the Cooper-Hewitt Museum for fundraising purposes from John and Yoko Lennon, the car remained on the Institution's books as an unaccessioned item since 1978. When the flurry of bidding was over, the car brought the unprecedented sum of \$2,086,450. Purchased by Mr. Jim Pattison, the car will be an integral part of the 1986 World's Fair to be held in Vancouver, British Columbia. The funds garnered by its sale have been deposited to benefit the Cooper-Hewitt Museum.

Endowment

The Smithsonian's Endowment Fund reached an all-time high of \$148,588,051 on September 30, 1985. It is important to recognize that the Endowment's recent growth can be attributed in large part to successful investment management and yearly additions drawn from revenues generated by the Institution's auxiliary activities.

The success of the Endowment is a living tribute to the memory of Regent William A. M. Burden, who served as Chairman of the Institution's Investment Policy Committee for fourteen years until his death on October 10, 1984. Regent Carlisle H. Humelsine assumed the role of Acting Chairman of the Investment Policy Committee at its fall 1984 meeting.

The Investment Policy Committee met three times during the fiscal year to review the management of the endowment funds. During the past year, the Institution has been equity oriented; this posture served it well as the stock market enjoyed an ebullient period during the summer of 1985. The Institution utilized the Total Return Income policy; total investment return is defined as yield (interest and dividends) plus appreciation, including both realized and unrealized gains. A portion of this return is made available for expenditure each year, and the remainder is reinvested as principal.

The Institution has four investment advisors: Fiduciary

Trust Company of New York, Batterymarch Financial Management, Torray Clark and Company, and Rollert and Sullivan Company, the successor to Granahan-Everitt. Advisors are given full discretion as to asset allocation and stock selection. At the suggestion of Batterymarch, in the fall of 1984, the Institution invested in the Trustees Commingled Fund-International Equity Portfolio. The handsome return provided by this investment along with the substantial appreciation enjoyed by the domestic stock market contributed to the endowment fund's stellar performance in 1985.

The Investment Policy Committee served as counsel to the Regents on the difficult questions surrounding investments in companies doing business in South Africa. On June 17, 1985, the Executive Committee of the Board of Regents instructed the Smithsonian's investment managers to dispose of the Institution's holdings in U.S. corporations which had not signed the Sullivan Principles, a code of conduct for American companies operating in South Africa. At the same time, the Executive Committee directed the managers to make new investments only in those corporations that were subscribers to the Sullivan Principles or had no business interests in South Africa. Parenthetically, the Smithsonian does not have and never has had any direct investments in South Africa.

At their meeting on September 16, 1985, the last of the fiscal year, the full Board of Regents reaffirmed the actions of the Executive Committee. Mindful both of their fiduciary obligations and of the Institution's position in American society, the Regents continue to monitor events in South Africa and developments in U.S. policy with respect to that nation. The Smithsonian has joined with the South Africa Research Consortium, a loose federation of thirty-seven colleges and universities, to supplement currently available information on the impact of investments on the South African economy.

Financial Management Activities

The arrival of a new Treasurer set in motion a general reassessment of the Institution's financial management practices and procedures. Falling under the aegis of the Treasurer is a diverse group of activities: Office of Accounting and Financial Services, Investment Management, Museum Shops, Mail Order Division, Parking, Concessions, Product Licensing, and Risk Management. With the exception of the Office of Accounting and Financial Services, the orientation is primarily on generating and securing private funds. The Treasurer maintains a close

working relationship with the Budget Office, under the Assistant Secretary for Administration, and the Office of Membership and Development.

A significant part of 1985 was spent by the Treasurer with assistance from staff and the Institution's internal and external auditors in assessing the capabilities of these offices and establishing goals. Highest priority has been given to maintaining the integrity of ongoing operations while planning for extensive future automation that would simplify record keeping, accelerate the processing of cash disbursements, and enhance overall fiscal efficiency.

The need for more senior management, particularly in the areas of investment management and long-term financial systems planning, became apparent as the assessment progressed. Thus, in April 1985, John R. Clarke was promoted to Assistant Treasurer for Financial Management and Planning. Mr. Clarke has served the Institution in various capacities during his thirteen-year tenure, most recently as Executive Assistant to the Treasurer and previously as Acting Budget Officer. His mandate is to oversee the Institution's working capital investment pool and endowment accounting and to work with internal resources in the development of new automated fiscal systems appropriate to the Institution's needs.

Related Organizations

The Woodrow Wilson International Center for Scholars, the National Gallery of Art, and the John F. Kennedy Center for the Performing Arts were established by Congress within the Institution. Each organization is administered by its own board of trustees and reports independently on its financial status. Fiscal, administrative, and other support services are provided the Woodrow Wilson International Center for Scholars on a reimbursement basis by the Smithsonian; office space is made available for Center operations. Administrative services are also offered by the Institution on a contract basis to Reading is Fundamental, Inc., and the Visions Foundation. An independent non-profit corporation, the Friends of the National Zoo (FONZ) operates under contract a number of beneficial concessions for the National Zoological Park.

Accounting and Auditing

The Institution's funds, federal and nonappropriated, are audited annually by the independent public accounting firm of Coopers & Lybrand. Their report for fiscal year

1985 is reprinted on the following pages. Coopers & Lybrand's consulting staff also provided assistance to the Institution during the year at the request of the Treasurer. Special studies were done with respect to payroll/personnel systems and the handling of cash receipts.

The Smithsonian's own internal audit staff regularly reviews the Smithsonian's activities and fiscal systems during the year. Additionally, the Defense Contract Audit Agency conducts an annual audit of grants and contracts received from federal agencies and monitors allocated administrative costs.

The Audit and Review Committee of the Board of Regents, chaired by Regent David Acheson, met three times during the fiscal year pursuant to their responsibilities under the bylaws of the Institution. In addition to the review of the 1984 audit performed by Coopers & Lybrand, special attention was given by the committee to the Institution's Business Management activities and the management of the National Zoo.

Smithsonian Institution Operating Funds

FISCAL YEARS 1965, 1975, 1980, 1984, 1985

(In \$1,000,000's)

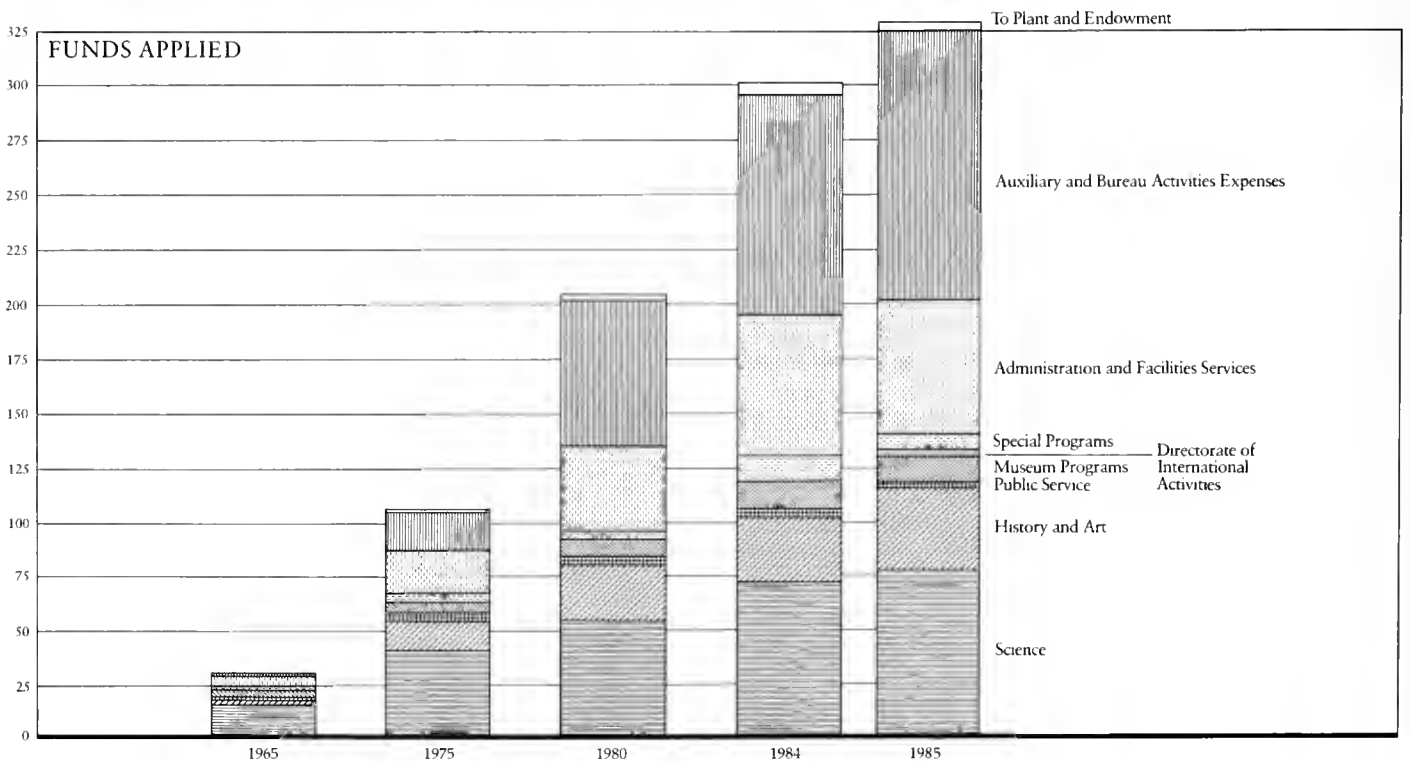
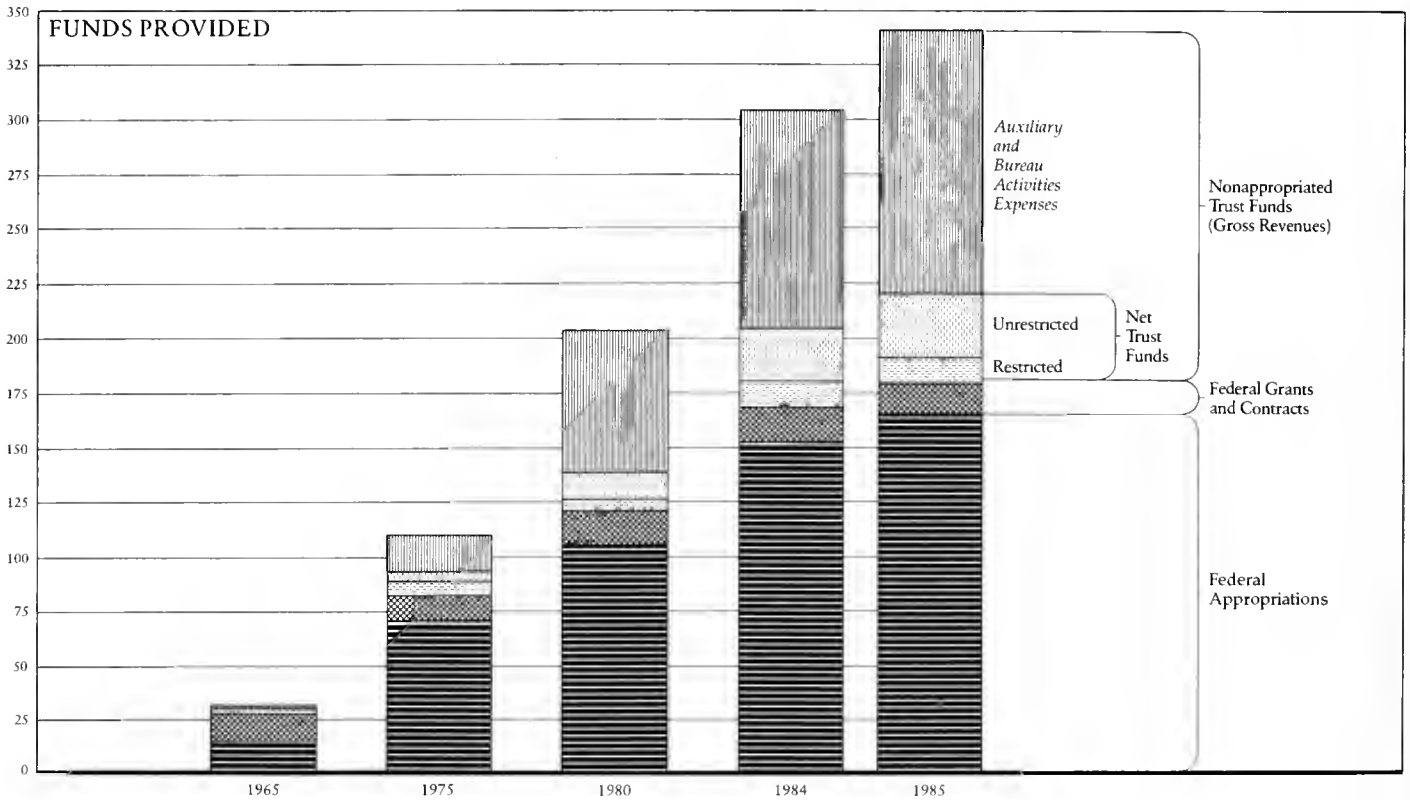


Table 1 Financial Summary (In \$1,000s)

	FY 1983	FY 1984	FY 1985
INSTITUTIONAL OPERATING FUNDS			
FUNDS PROVIDED:			
Federal Appropriations—Salaries & Expenses	\$147,256	\$156,683	\$164,321
Federal Agency Grants & Contracts	13,125	14,878	15,653
Nonappropriated Trust Funds:			
For Restricted Purposes	9,162	10,182	9,937
For Unrestricted & Special Purposes:			
Auxiliary & Bureau Activities Revenues—Gross	104,129	117,550	141,160
Less Related Expenses	(89,397)	(97,898)	(119,361)
Auxiliary & Bureau Activities Net Revenue	14,732	19,652	21,799
Investment, Gift & Other Income	4,302	5,057	6,744
Total Net Unrestricted & Special Purpose Revenue	19,034	24,709	28,543
Total Nonappropriated Trust Funds—Gross	117,593	132,789	157,841
—Net	28,196	34,891	38,480
Total Operating Funds Provided—Gross	277,974	304,350	337,815
—Net	<u>\$188,577</u>	<u>\$206,452</u>	<u>\$218,454</u>
FUNDS APPLIED:			
Science	\$ 68,895	\$ 74,134	\$ 80,586
Less SAO Overhead Recovery	(2,264)	(2,226)	(2,282)
History & Art	30,979	33,011	36,208
Public Service	2,843	3,526	4,480
Museum Programs	9,702	10,976	11,159
Directorate of International Activities	—	—	642
Special Programs	13,342	14,805	14,654
Associates & Business Management	1,057	884	930
Administration—Federal*	11,032	12,201	11,549
—Nonappropriated Trust Funds	7,226	8,211	7,814
Less Smithsonian Overhead Recovery	(6,331)	(6,528)	(7,391)
Facilities Services	43,653	46,821	48,576
Total Operating Funds Applied	180,134	195,815	206,925
Transfers (Nonappropriated Trust Funds)			
Unrestricted Funds—To Plant	2,069	3,424	20
—To Endowment	3,084	3,313	3,014
Restricted Funds—To Endowment	637	222	129
Total Operating Funds Applied & Transferred Out	<u>\$185,924</u>	<u>\$202,774</u>	<u>\$210,088</u>
CHANGES IN NONAPPROPRIATED TRUST FUND BALANCES:			
Restricted Purpose (Incl. Fed. Agency Gr. & Contracts)	\$ 1,765	\$ 1,426	\$ 587
Unrestricted—General Purpose	28	10	52
—Special Purpose	860	2,242	7,727
Total	<u>\$ 2,653</u>	<u>\$ 3,678</u>	<u>\$ 8,366</u>
YEAR-END BALANCES—NONAPPROPRIATED TRUST FUNDS:			
Restricted Purpose	\$ 7,671	\$ 9,097	\$ 9,684
Unrestricted—General Purpose	5,076	5,086	5,138
—Special Purpose	13,863	16,105	23,832
Total	<u>\$ 26,610</u>	<u>\$ 30,288</u>	<u>\$ 38,654</u>
OTHER FEDERAL APPROPRIATIONS			
Special Foreign Currency Program	\$ 2,000	\$ 7,040	\$ 8,820
Construction	46,500	4,500	18,326
Total Federal Appropriations (Inc. S&E above)	<u>\$195,756</u>	<u>\$168,223</u>	<u>\$191,467</u>

*Includes unobligated funds returned to Treasury: FY 1983—\$62,000; FY 1984—\$102,000; FY 1985—\$173,000.

Table 2 Source and Application of Operating Funds Year Ended September 30, 1985
(Excludes Special Foreign Currency Funds, Plant Funds and Endowments) (In \$1,000s)

Funds	Federal Funds	Total Non-federal Funds	Nonfederal Funds				
			Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Grants and Contracts
FUND BALANCES—10/1/84	\$ —	\$ 30,288	\$ 5,086	\$ —	\$ 16,105	\$ 8,810	\$ 287
FUNDS PROVIDED							
Federal Appropriations	164,321	—	—	—	—	—	—
Investment Income	—	8,421	4,137	—	645	3,639	—
Grants and Contracts	—	15,652	—	—	—	—	15,652
Gifts	—	8,692	37	3,150	12	5,493	—
Sales and Revenue	—	138,010	—	132,218	5,792	—	—
Other	—	2,719	233	—	1,680	805	1
Total Provided	164,321	173,494	4,407	135,368	8,129	9,937	15,653
Total Available	\$ 164,321	\$ 203,782	\$ 9,493	\$ 135,368	\$ 24,234	\$ 18,747	\$ 15,940
FUNDS APPLIED							
<i>Science:</i>							
Assistant Secretary	\$ 516	\$ 1,555	\$ 96	\$ —	\$ 62	\$ 228	\$ 1,169
Natl. Mus. of Nat. History/Museum of Man	20,194	4,610	65	—	1,791	1,691	1,063
Astrophysical Observatory	8,446	16,894	2,310	—	1,718	268	12,598
Less Overhead Recovery	—	(2,282)	(2,282)	—	—	—	—
Tropical Research Institute	3,554	971	148	—	481	338	4
Environmental Resch. Center	3,324	613	82	—	130	24	377
Natl. Air & Space Museum	8,112	3,488	8	—	3,127	252	101
Natl. Zoological Park	11,104	562	110	—	216	156	80
Total Science	55,250	26,411	537	—	7,525	2,957	15,392
<i>History and Art:</i>							
Assistant Secretary	401	5	5	—	—	—	—
Natl. Mus. of Am. History	11,081	1,461	355	—	797	268	41
Natl. Mus. of American Art	4,625	931	63	—	551	315	2
Natl. Portrait Gallery	3,407	326	13	—	121	192	—
Hirshhorn Museum	2,923	491	14	—	258	219	—
Center for Asian Art	1,549	2,247	56	—	59	2,132	—
Archives of American Art	732	998	2	—	1	995	—
Cooper-Hewitt Museum	880	2,156	720	—	944	421	71
Natl. Mus. of African Art	1,188	763	600	—	105	58	—
Anacostia Museum	817	39	38	—	—	1	—
Total History and Art	27,603	9,417	1,866	—	2,836	4,601	114
<i>Public Service:</i>							
Assistant Secretary	217	469	102	—	289	78	—
Reception Center	181	663	662	—	1	—	—
Telecommunications	213	686	522	—	163	1	—
Smithsonian Press	1,124	13,753	—	13,646	49	58	—
Office of Public Affairs	559	336	325	—	10	1	—
Total Public Service	2,294	15,907	1,611	13,646	512	138	—

Table 2 Source and Application of Operating Funds Year Ended September 30, 1985 (Continued)
(Excludes Special Foreign Currency Funds, Plant Funds and Endowments) (In \$1,000s)

Funds	Nonfederal Funds						
	Federal Funds	Total Non-federal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Grants and Contracts
<i>Museum Programs:</i>							
Assistant Secretary	593	473	14	—	81	376	2
Registrar	32	—	—	—	—	—	—
Conserv. Analytical Laboratory	1,097	29	—	—	29	—	—
Libraries	4,252	360	312	—	12	36	—
Exhibits	1,470	87	—	—	87	—	—
Traveling Exhib. Service	332	2,638	—	1,561	413	651	13
Archives	511	147	146	—	1	—	—
National Museum Act	753	—	—	—	—	—	—
Total Museum Programs	9,040	3,734	472	1,561	623	1,063	15
Directorate of Int'l Activities	272	370	370	—	—	—	—
<i>Special Programs</i>							
Am. Studies & Folklife Pgm.	698	1,380	514	—	503	320	43
Int. Environ. Science Pgm.	680	—	—	—	—	—	—
Academic & Educational Pgm.	705	2,004	370	—	1,552	82	—
Collections Mgt./Inventory	1,019	—	—	—	—	—	—
Museum Support Center	7,484	83	—	—	83	—	—
JFK Center Grant	686	—	—	—	—	—	—
Total Special Programs	11,272	3,467	884	—	2,138	402	43
Associate Programs	—	69,155	857	68,214	56	24	4
Business Management	—	30,334	—	30,334	—	—	—
Administration	11,376	8,986	7,072	78	1,722	114	—
Less Overhead Recovery	—	7,391	7,391	—	—	—	—
Facilities Services	47,041	1,575	1,422	—	146	7	—
<i>Transfers Out/(In):</i>							
Treasury	173*	—	—	—	—	—	—
Coll. Acq., Schol. St., Outreach	—	—	2,700	—	(2,700)	—	—
Net Auxiliary Activities	—	—	(20,720)	20,720	—	—	—
Other Designated Purposes	—	—	11,655	815	(12,470)	—	—
Plant	—	20	20	—	—	—	—
Endowment	—	3,143	3,000	—	14	129	—
Total Transfers	173	3,163	(3,345)	21,535	(15,156)	129	—
Total Funds Applied	\$164,321	\$165,128	\$ 4,355	\$135,368	\$ 402	\$ 9,435	\$15,568
FUND BALANCES 9/30/85	\$ —	\$ 38,654	\$ 5,138	\$ —	\$23,832	\$ 9,312	\$ 372

*Unobligated funds returned to Treasury

Table 3 Grants and Contracts—Expenditures (In \$1,000s)

Federal Agencies	FY 1983	FY 1984	FY 1985
Agency for International Development	\$ —	\$ 428	\$ 828
Department of Commerce	(7)	57	87
Department of Defense	1,299	1,056	1,245
Department of Energy	358	227	260
Department of Health and Human Services	280	273	438
Department of Interior	238	204	196
National Aeronautics and Space Administration*	9,551	11,275	11,425
National Science Foundation**	928	820	895
Other	415	501	194
Total	<u>\$13,062</u>	<u>\$14,841</u>	<u>\$15,568</u>

*Includes \$197,000 (FY 1983), \$399,000 (FY 1984), and \$495,000 (FY 1985) in subcontracts from other organizations receiving prime contract funding from NASA.

**Includes \$196,000 (FY 1983), \$250,000 (FY 1984), and \$321,000 (FY 1985) in NSF subcontracts from the Chesapeake Research Consortium.

Table 4 Restricted Operating Trust Funds*
Fiscal Years 1983–1985 (In \$1,000s)

Item	Investment	Gifts	Miscellaneous	Total revenue	Deductions	Transfers in (out)	Net increase (decrease)	Fund balance end of Year
FY 1983—Total	<u>\$2,971</u>	<u>\$5,419</u>	<u>\$ 772</u>	<u>\$ 9,162</u>	<u>\$6,823</u>	<u>\$(637)</u>	<u>\$1,702</u>	<u>\$7,421</u>
FY 1984—Total	<u>\$3,236</u>	<u>\$5,859</u>	<u>\$1,087</u>	<u>\$10,182</u>	<u>\$8,571</u>	<u>\$(222)</u>	<u>\$1,389</u>	<u>\$8,810</u>
FY 1985:								
National Museum of Natural History	\$1,279	\$ 592	\$ 18	\$ 1,889	\$1,691	\$ (11)	\$ 187	\$1,530
Astrophysical Observatory	84	159	—	243	268	3	(22)	(38)
Tropical Research Institute	55	546	—	601	338	10	273	508
National Air and Space Museum	89	259	2	350	252	—	98	177
National Zoological Park	25	100	—	125	156	—	(31)	118
Other Science	135	131	—	266	252	(128)	(114)	578
National Museum of American History	80	491	3	574	268	—	306	833
National Museum of American Art	93	400	5	498	315	—	183	663
National Portrait Gallery	19	139	—	158	192	—	(34)	145
Hirshhorn Museum	70	1	—	71	219	—	(148)	588
Center for Asian Art	1,256	26	539	1,821	2,132	—	(311)	1,241
Archives of American Art	34	578	206	818	995	—	(177)	353
Cooper-Hewitt Museum	94	642	28	764	421	—	343	1,036
Traveling Exhibition Service	87	522	—	609	651	—	(42)	888
All Other	239	907	4	1,150	1,156	(3)	(9)	692
Total FY 1985	<u>\$3,639</u>	<u>\$5,493</u>	<u>\$ 805</u>	<u>\$ 9,937</u>	<u>\$9,306</u>	<u>\$(129)</u>	<u>\$ 502</u>	<u>\$9,312</u>

*Does not include Federal Agency Grants and Contracts

Table 5 Unrestricted Trust Funds—General and Auxiliary Activities
Fiscal Years 1983–1985 (In \$1,000s)

Item	FY 1983	FY 1984	FY 1985
FUNDS PROVIDED			
General Income:			
Investments	\$ 2,489	\$ 3,108	\$ 4,137
Gifts	24	35	37
Miscellaneous	46	(6)	233
Total General Income	2,559	3,137	4,407
Auxiliary Activities Income (Net):			
Associates	9,864	13,075	13,518
Business Management:			
—Museum Shops and Mail Order	2,710	3,711	5,292
—Concessions, Parking and Food Services	1,670	1,691	1,077
—Other	(300)	(206)	(228)
Smithsonian Press	232	1,158	2,176
Traveling Exhibitions	(363)	(421)	(311)
Photo Services	19	5	11
Total Auxiliary Activities	13,832	19,013	21,535
Total Funds Provided (Net)	16,391	22,150	25,942
EXPENDITURES AND TRANSFERS			
Administrative and Program Expense	14,727	16,769	17,373
Less Administrative Recovery	8,595	8,754	9,673
Net Expense	6,132	8,015	7,700
Less Transfers:			
To Special Purpose for Program Purposes	5,205	7,429	15,170
To Plant Funds	2,005	3,400	20
To Endowment Funds	3,021	3,296	3,000
NET ADDITION TO FUND BALANCE	28	10	52
ENDING FUND BALANCE	\$ 5,076	\$ 5,086	\$ 5,138

Table 6 Auxiliary Activities Fiscal Years 1983–1985 (In \$1,000s)

Activity	Sales and other revenue	Gifts	Less cost of sales	Gross revenue	Expenses	Net revenue** (loss)
FY 1983	\$ 98,826	\$2,171	\$57,527	\$43,470	\$29,638	\$13,832
FY 1984	\$112,179	\$2,698	\$65,309	\$49,568	\$30,555	\$19,013
FY 1985:						
Associates	\$ 78,582	\$3,150	\$52,736	\$28,996	\$15,478	\$13,518
Business Management:						
—Museum Shops*	33,668	—	18,272	15,396	10,104	5,292
—Concessions/Parking	2,652	—	—	2,652	1,575	1,077
—Other	155	—	—	155	383	(228)
Smithsonian Press	15,821	—	4,908	10,913	8,737	2,176
Traveling Exhibitions	1,250	—	667	583	894	(311)
Photo Services (Administration)	90	—	10	80	69	11
Total FY 1985	\$132,218	\$3,150	\$76,593	\$58,775	\$37,240	\$21,535

*Includes Museum Shops and Mail Order.

**Before revenue-sharing transfers to participating Smithsonian bureaus of \$486,000 (FY 1983); \$638,000 (FY 1984); and \$815,000 (FY 1985).

Table 7 Unrestricted Special Purpose Funds
Fiscal Years 1983–1985 (In \$1,000s)

Item	Revenue				Transfers in (out)	Deductions			Fund balance end of year
	Investment	Bureau activities	Gifts and other revenue	Total revenue		Program expense	Bureau activity expense	Net increase (decrease)	
FY 1983	<u>\$686</u>	<u>\$3,132</u>	<u>\$1,057</u>	<u>\$4,875</u>	<u>\$ 5,078</u>	<u>\$ 6,861</u>	<u>\$2,232</u>	<u>\$ 860</u>	<u>\$13,863</u>
FY 1984	<u>\$679</u>	<u>\$2,673</u>	<u>\$1,241</u>	<u>\$4,593</u>	<u>\$ 7,388</u>	<u>\$ 7,705</u>	<u>\$2,034</u>	<u>\$2,242</u>	<u>\$16,105</u>
FY 1985:									
National Museum of Natural History	\$ 75	\$ 2	\$ 47	\$ 124	\$ 2,089	\$ 1,791	\$ —	\$ 422	\$ 1,276
Astrophysical Observatory	7	546	27	580	943	547	565	411	1,090
Astrophysical Observatory Computer Center	—	606	—	606	—	—	606	—	—
Tropical Research Institute	16	193	—	209	221	279	202	(51)	102
National Air and Space Museum	111	2,204	240	2,555	(115)	1,193	1,934	(687)	1,306
Environmental Research Center	9	34	5	48	98	95	35	16	191
National Zoological Park	251	—	480	731	246	216	—	761	3,071
National Museum of American History ...	22	41	102	165	1,180	686	107	552	1,034
National Museum of American Art	18	9	99	126	586	546	5	161	336
National Portrait Gallery	4	12	22	38	70	111	10	(13)	122
Hirshhorn Museum ...	19	—	66	85	3,205	258	—	3,032	3,496
Cooper-Hewitt Museum National Museum of African Art	21	786	198	1,005	488	255	689	549	751
Office of Telecommunications .	1	3	19	23	572	104	1	490	538
Liability Reserves	—	53	—	53	—	88	75	(110)	164
Unallocated Coll. Acq., Schol. Studies, Outreach and Spec. Exhib.	—	—	—	—	133	36	—	97	3,370
Fellowships	27	—	—	27	1,115	—	—	1,115	1,685
Museum Support Center Equipment	—	—	—	—	1,627	1,468	—	186	1,220
Traveling Exhibition Service	—	—	—	—	—	83	—	(83)	318
Smithsonian Central Computer Center ...	3	—	56	59	490	413	—	136	446
All Other	—	1,061	34	1,095	—	—	1,095	—	—
Total FY 1985 ...	<u>61</u>	<u>242</u>	<u>297</u>	<u>600</u>	<u>2,208</u>	<u>1,861</u>	<u>204</u>	<u>743</u>	<u>3,316</u>
	<u>\$645</u>	<u>\$5,792</u>	<u>\$1,692</u>	<u>\$8,129</u>	<u>\$15,156</u>	<u>\$10,030</u>	<u>\$5,528</u>	<u>\$7,727</u>	<u>\$23,832</u>

**Table 8 Special Foreign Currency Program
Fiscal Year 1985—Obligations (In \$1,000s)**

Country	Archaeology	Systematic and environmental biology	Astrophysics and earth sciences	Museum programs	Grant Administration	Total
India	\$6,932	\$262	\$236	\$42	\$632*	\$8,104
Pakistan	1,095	10	15	—	7	1,127
Burma	—	5	—	1	—	6
Guinea	21	—	—	—	—	21
Total	<u>\$8,048</u>	<u>\$277</u>	<u>\$251</u>	<u>\$43</u>	<u>\$639</u>	<u>\$9,258</u>

*Includes \$475,500 for translation services in support of all programs.

**Table 9 Construction and Plant Funds
Fiscal Years 1983–1985 (In \$1,000s)**

Sources	FY 1983	FY 1984	FY 1985
FUNDS PROVIDED			
Federal Appropriations:			
National Zoological Park	\$ 1,550	\$ 3,500	\$ 4,851
Restoration and Renovation of Buildings	8,450	9,000	13,475
Quadrangle	36,500	(8,000)	—
Total Federal Appropriations	<u>46,500</u>	<u>4,500</u>	<u>18,326</u>
Nonappropriated Trust Funds:			
Income—Gift and Other			
Smithsonian Environmental Research Center—Gain on Sale	44	—	—
Smithsonian Tropical Research Institute—Research Facilities	66	20	373
Erection of Jacksonville Bandstand	174	12	3
Cooper-Hewitt Museum	163	32	2,544
American Art and Portrait Gallery Building	21	21	20
Quadrangle and Related	14,574	8,098	1,908**
Smithsonian Institution Building South Entrance	5	3	1
Belmont Conference Center—Gain on Sale	1,405*	—	—
Horticulture Antique Greenhouse	—	16	—
Total Income	<u>16,452</u>	<u>8,202</u>	<u>4,849</u>
Transfers from Current Funds:			
National Museum of African Art	24	24	20
Quadrangle	2,040	2,700	—
East Garden	5	—	—
Secretaries' Residence	—	700	—
Total Transfers	<u>2,069</u>	<u>3,424</u>	<u>20</u>
Total Funds Provided	<u>\$65,021</u>	<u>\$16,126</u>	<u>\$23,195</u>

*Total proceeds realized of \$1,993,000; of which \$1,750,000 was directed to construction of the Museum Support Center and \$208,000 was transferred to endowment funds.

**In the application of Plant Funds for this project, a \$4,000,000 pledge receivable was written off as uncollectible.

Table 10 Endowment and Similar Funds September 30, 1985

	Book Value	Market Value
ASSETS		
Pooled Consolidated Endowment Funds:		
Cash and Equivalents	\$ 19,351,107	\$ 19,351,107
Bonds	9,464,055	10,399,674
Convertible Bonds	3,753,813	3,266,500
Stocks	103,587,334	114,282,790
Total Pooled Funds	<u>136,156,309</u>	<u>147,300,071</u>
Nonpooled Endowment Funds:		
Loan to U.S. Treasury in Perpetuity	1,000,000	1,000,000
Notes Receivable	40,754	40,754
Bonds	10,000	10,226
Land, Net	237,000	237,000
Total Nonpooled Funds	<u>1,287,754</u>	<u>1,287,980</u>
Total Endowment and Similar Fund Balances	<u>\$137,444,063</u>	<u>\$148,588,051</u>
FUND BALANCES		
Unrestricted Purpose:		
True Endowment	\$ 4,537,800	\$ 5,469,631
Quasi Endowment	58,957,335	61,073,854
Total Unrestricted Purpose	<u>63,495,135</u>	<u>66,543,485</u>
Restricted Purpose:		
True Endowment	54,875,497	61,360,250
Quasi Endowment	19,073,431	20,684,316
Total Restricted Purpose	<u>73,948,928</u>	<u>82,044,566</u>
Total Endowment and Similar Fund Balances	<u>\$137,444,063</u>	<u>\$148,588,051</u>

Table 11 Market Values of Pooled Consolidated Endowment Funds (In \$1,000s)

Fund	9/30/81	9/30/82	9/30/83	9/30/84	9/30/85
Unrestricted	\$30,399	\$35,974	\$ 54,677	\$ 56,592	\$ 65,404
Freer	20,472	22,596	32,096	31,125	34,066
Other Restricted	<u>27,101</u>	<u>30,288</u>	<u>43,911</u>	<u>43,396</u>	<u>47,830</u>
Total	<u>\$77,972</u>	<u>\$88,858</u>	<u>\$130,684</u>	<u>\$131,113</u>	<u>\$147,300</u>

Table 12 Changes in Pooled Consolidated Endowment Funds for Fiscal Year 1985 (In \$1,000s)

Fund	Market value 9/30/84	Gifts and transfers	Interest and dividends*	Income paid out	Subtotal	Market value appreciation	Market value 9/30/85
Unrestricted	\$ 56,592	\$3,056	\$2,885	\$1,583	\$ 60,950	\$ 4,454	\$ 65,404
Freer	31,125	—	1,582	1,131	31,576	2,490	34,066
Other Restricted	<u>43,396</u>	<u>332</u>	<u>2,212</u>	<u>1,581</u>	<u>44,359</u>	<u>3,471</u>	<u>47,830</u>
Total	<u>\$131,113</u>	<u>\$3,388</u>	<u>\$6,679</u>	<u>\$4,295</u>	<u>\$136,885</u>	<u>\$10,415</u>	<u>\$147,300</u>

*Income earned, less managers' fees of \$555,507

Table 13 Endowment Funds September 30, 1985

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
UNRESTRICTED PURPOSE—TRUE:				
Avery Fund*	\$ 152,106	\$ 187,057	\$ 4,968	\$ -0-
Higbee, Harry, Memorial	44,544	54,691	1,342	-0-
Hodgkins Fund*	248,869	262,753	9,568	-0-
Morrow, Dwight W.	267,624	336,430	8,258	-0-
Mussinan, Alfred	83,862	98,386	2,415	-0-
Olmsted, Helen A.	2,800	3,434	84	-0-
Poore, Lucy T. and George W.*	596,599	746,575	19,042	-0-
Porter, Henry Kirke, Memorial	989,580	1,242,312	30,494	-0-
Sanford, George H.*	4,293	5,070	154	-0-
Smithson, James*	599,277	596,747	29,200	-0-
Walcott, Charles D. and Mary Vaux, Research (Designated)	1,548,246	1,936,176	69,053	29,475
Subtotal	4,537,800	5,469,631	174,578	29,475
UNRESTRICTED PURPOSE—QUASI:				
Forrest, Robert Lee	3,845,679	3,743,819	91,895	-0-
General Endowment*	50,218,718	52,388,962	1,225,531	-0-
Goddard, Robert H.	30,435	29,649	728	-0-
Habel, Dr. S.*	553	551	27	-0-
Hart, Gustavus E.	1,962	2,219	54	-0-
Henry, Caroline	4,855	5,472	134	-0-
Henry, Joseph and Harriet A.	195,247	218,870	5,372	-0-
Heys, Maude C.	369,205	364,294	8,942	-0-
Hinton, Carrie Susan	99,435	106,568	2,616	-0-
Lambert, Paula C.	179,215	195,512	4,799	-0-
Medinus, Grace L.	3,656	3,626	89	-0-
Rhees, William Jones*	2,542	2,772	83	-0-
Safford, Clara Louise	168,811	170,158	4,177	-0-
Smithsonian Bequest Fund*	742,745	755,293	13,825	-0-
Taggart, Ganson	1,673	2,073	51	-0-
Abbott, William L. (Designated)	457,303	514,463	17,081	31,598
Barstow, Frederic D. (Designated)	3,828	4,300	143	5,553
Lindbergh Chair of Aerospace History (Designated)	1,754,572	1,781,810	59,159	80,859
Lindbergh, Charles A. (Designated)	15,114	16,510	1,324	9,342
Lyon, Marcus Ward, Jr. (Designated)	15,184	15,330	509	2,666
Webb, James E., Fellowship (Designated)	846,603	751,603	24,955	26,723
Subtotal	58,957,335	61,073,854	1,461,494	156,741
Total Unrestricted Purpose	\$ 63,495,135	\$ 66,543,485	\$1,636,072	\$ 186,216

Table 13 Endowment Funds September 30, 1985 (Continued)

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
RESTRICTED PURPOSE—TRUE:				
Arthur, James	\$ 132,906	\$ 168,507	\$ 5,595	\$ 5,619
Baird, Spencer Fullerton	120,303	150,628	5,001	6,699
Barney, Alice Pike, Memorial	95,277	120,753	4,009	20,509
Batchelor, Emma E.	119,609	124,906	4,147	71,076
Beauregard, Catherine, Memorial	150,147	168,742	5,603	52,296
Bergen, Charlotte V.	13,010	12,471	414	1,135
Brown, Roland W.	101,269	115,809	3,845	14,962
Canfield, Frederick A.	136,898	185,656	6,164	293
Casey, Thomas Lincoln	48,096	54,099	1,796	4,717
Chamberlain, Frances Lea	93,548	118,564	3,937	21,629
Cooper Fund for Paleobiology	97,376	96,176	3,127	—0—
Division of Mammals Curators Fund	6,927	7,517	250	4,384
Drake Foundation	622,142	663,548	21,928	95,275
Drouet, Francis and Louderback, Harold B. Fund	208,665	201,355	6,612	27,842
Dykes, Charles, Bequest	179,995	198,945	6,605	21,799
Eickemeyer, Florence Brevoort	36,102	45,747	1,519	22,738
Freer, Charles L.	30,352,306	34,065,689	1,131,040	911,194
Grimm, Sergei N.	109,426	106,730	3,544	16,188
Groom, Barrick W.	112,249	107,438	3,117	4,368
Guggenheim, Daniel and Florence	427,700	435,876	14,472	32,419
Hamilton, James*	4,155	4,578	196	1,625
Henderson, Edward P., Meteorite Fund	1,257	1,499	50	490
Hewitt, Eleanor G., Repair Fund	25,783	27,404	910	946
Hewitt, Sarah Cooper	152,431	161,756	5,370	5,666
Hillyer, Virgil	25,220	28,370	942	10,326
Hitchcock, Albert S.	5,285	6,750	224	151
Hodgkins Fund*	110,615	110,156	5,440	33,961
Hrdlicka, Ales and Marie	183,437	209,784	6,965	12,314
Hughes, Bruce	63,624	80,684	2,679	14,552
Johnson, Seward, Trust Fund for Oceanography	12,563,454	14,168,424	470,417	119,564
Kellogg, Remington, Memorial	87,632	87,385	2,901	8,917
Kramar, Nada	10,080	11,029	366	3,528
Lindsey, Jessie H.*	12,546	13,008	1,132	9,630
Maxwell, Mary E.	65,193	82,668	2,745	28,591
Milliken, H. Oothout, Memorial	760	805	27	51
Mineral Endowment	345,701	371,266	12,327	411
Mitchell, William A.	47,112	50,789	1,686	490
Natural History and Conservation	91,427	94,872	3,027	—0—
Nelson, Edward William	76,431	93,615	3,108	9,943
Petrocelli, Joseph, Memorial	24,684	31,357	1,041	27,872
Reid, Addison T.*	80,393	88,837	3,146	10,503
Roebing Fund	400,111	505,703	16,790	521
Rollins, Miriam and William	778,231	904,925	29,767	4,490
Sims, George W.	81,495	77,269	2,397	3,077
Sprague Fund	5,077,848	5,411,148	177,995	5,421
Springer, Frank	59,833	75,462	2,505	25,243
Stern, Harold P., Memorial	611,950	647,602	18,847	66,298
Stevenson, John A., Mycological Library	18,421	20,617	685	1,777
Walcott, Charles D. and Mary Vaux, Research	501,439	571,918	18,775	13,322
Walcott Research Fund, Botanical Publications	189,888	255,241	8,249	6,449
Williston, Samuel Wendell Diptera Research	11,968	12,205	390	1,692
Zerbee, Frances Brinckle	3,142	3,968	132	5,137
Subtotal	54,875,497	61,360,250	2,033,956	1,768,100

Table 13 Endowment Funds September 30, 1985 (Continued)

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
RESTRICTED PURPOSE—QUASI:				
Armstrong, Edwin James	11,833	12,414	405	-0-
Au Panier Fleuri	71,508	69,826	2,318	2,435
Bacon, Virginia Purdy	331,299	350,461	11,636	22,202
Becker, George F.	571,087	606,582	20,140	-0-
Desautels, Paul E.	43,117	47,863	1,560	-0-
Gaver, Gordon	4,501	4,933	164	2,107
Hachenberg, George P. and Caroline	15,908	18,438	612	1,979
Hanson, Martin Gustav and Caroline R.	34,102	38,348	1,273	6,373
Hunterdon Endowment	11,369,436	12,600,705	418,365	159,995
ICBP Endowment	674,610	674,789	21,910	11,816
ICBP Conservation Endowment	151,657	149,060	4,899	6,580
Johnson, E. R. Fenimore	28,225	28,393	943	3,951
Loeb, Morris	336,549	380,326	12,628	30,010
Long, Annette E. and Edith C.	1,830	2,349	78	368
Myer, Catherine Walden	77,509	87,165	2,894	15,797
Noyes, Frank B.	3,812	4,393	146	2,668
Noyes, Pauline Riggs	33,677	32,903	1,092	1,146
Pell, Cornelia Livingston	28,538	32,179	1,068	2,962
Ramsey, Adm. and Mrs. Dewitt Clinton*	1,080,946	1,099,883	37,108	2,073
Rathbun, Richard, Memorial	40,915	46,107	1,531	19,617
Roebing Solar Research	91,587	99,130	3,291	8,622
Ruef, Bertha M.	110,042	110,648	3,674	12,104
Schultz, Leonard P.	29,715	33,353	1,107	27,894
Seidell, Atherton	2,264,347	2,396,497	79,568	296,770
Smithsonian Agency Account	1,133,586	1,158,327	39,368	157
Strong, Julia D.	38,453	43,325	1,438	2,226
Witherspoon, Thomas A., Memorial	494,642	555,919	18,457	28,624
Subtotal	19,073,431	20,684,316	687,673	668,476
Total Restricted Purpose	\$ 73,948,928	\$ 82,044,566	\$2,721,629	\$2,436,576
TOTAL ENDOWMENT FUNDS	\$137,444,063	\$148,588,051	\$4,357,701**	\$2,622,792

*Invested all or in part in U.S. Treasury or other nonpooled investments.

**Total Return Income Payout; does not include \$265,460 of interest income for investment of unexpended income balances.

Coopers & Lybrand
Certified Public Accountants

To the Board of Regents
Smithsonian Institution

We have examined the statement of financial condition of the Smithsonian Institution as of September 30, 1985, and the related statement of financial activity for the year then ended. Our examination was made in accordance with generally accepted auditing standards and with generally accepted governmental auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the financial statements of the Smithsonian Institution for the year ended September 30, 1984, totals of which are included in the accompanying financial statements for comparative purposes only.

In our opinion, the financial statements for the year ended September 30, 1985, referred to above, present fairly the financial position of the Smithsonian Institution as of September 30, 1985, and the results of its operations and changes in its fund balances for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Coopers & Lybrand

1800 M Street, N. W.
Washington, D. C. 20036
December 18, 1985

Smithsonian Institution Statement of Financial Condition
September 30, 1985 (with comparative totals for September 30, 1984)
(thousands of dollars)

	Trust funds	Federal funds	Totals, all funds	Totals, 1984
ASSETS:				
Cash on hand and in banks (Note 3)	\$ 2,207	\$ 10	\$ 2,217	\$ 3,837
Fund balances with U. S. Treasury (Note 4)	620	72,528	73,148	69,411
Investments (Notes 1 and 5)	192,602	—	192,602	166,806
Receivables (Note 7)	40,169	474	40,643	45,802
Advance payments (Note 8)	452	16,115	16,567	13,832
Merchandise inventory (Note 1)	11,340	—	11,340	8,902
Materials and supplies inventory (Note 1)	—	1,340	1,340	3,266
Amount to be provided for accrued annual leave (Note 1)	—	7,658	7,658	7,124
Prepaid, deferred expense and other (Note 1)	13,400	—	13,400	11,573
Property and equipment (Notes 1 and 9)	34,334	201,355	235,689	208,201
Total assets	<u>\$295,124</u>	<u>\$299,480</u>	<u>\$594,604</u>	<u>\$538,754</u>
LIABILITIES:				
Accounts payable and accrued expenses, including interfund payable of \$18,940	\$ 34,157	\$ 16,150	\$ 50,307	\$ 45,091
Deposits held in custody for other organizations (Note 2)	3,912	25	3,937	3,084
Accrued annual leave (Note 1)	1,664	7,658	9,322	8,459
Deferred revenue (Note 1)	28,133	—	28,133	24,815
Total liabilities	<u>67,866</u>	<u>23,833</u>	<u>91,699</u>	<u>81,449</u>
Undelivered orders (Note 1)	—	57,425	57,425	62,597
FUND BALANCES (Note 1):				
Trust Funds:				
Current:				
Unrestricted general purpose	5,138	—	5,138	5,086
Special purpose	23,832	—	23,832	16,105
Restricted	9,684	—	9,684	9,097
Endowment and similar funds (Note 6)	137,444	—	137,444	118,153
Plant funds (Note 9)	51,160	—	51,160	50,449
Total trust fund balances	<u>227,258</u>	<u>—</u>	<u>227,258</u>	<u>198,890</u>
Federal funds:				
Operating funds	—	177	177	175
Construction funds	—	15,349	15,349	9,427
Capital funds	—	202,696	202,696	186,216
Total federal fund balances	<u>—</u>	<u>218,222</u>	<u>218,222</u>	<u>195,818</u>
Total fund balances	<u>227,258</u>	<u>218,222</u>	<u>445,480</u>	<u>394,708</u>
Total liabilities, undelivered orders and fund balances	<u>\$295,124</u>	<u>\$299,480</u>	<u>\$594,604</u>	<u>\$538,754</u>

The accompanying notes are an integral part of these financial statements.

Smithsonian Institution Statement of Financial Activity for the year ended September 30, 1985
(with comparative totals for the year ended September 30, 1984) (thousands of dollars)

	Trust funds				Totals, federal funds
	Totals, trust funds	Current funds	Endowment and similar funds	Plant funds	
REVENUE AND OTHER ADDITIONS:					
Appropriations, net	\$ —	\$ —	\$ —	\$ —	\$191,467
Auxiliary activities revenue	138,010	138,010	—	—	—
Federal grants and contracts	15,652	15,652	—	—	—
Investment income (net of \$556,000 for management and custodian fees)	12,658	10,821	—	1,837	—
Net gain on sale of securities and property	15,745	71	13,539	2,135	—
Gifts, bequests and foundation grants	9,742	8,692	173	877	—
Additions to plant (Note 9)	10,167	—	—	10,167	32,897
Rentals, fees, commissions and other	3,282	3,282	—	—	137
Total revenue and other additions	<u>205,256</u>	<u>176,528</u>	<u>13,712</u>	<u>15,016</u>	<u>224,501</u>
EXPENDITURES AND OTHER DEDUCTIONS:					
Research and educational expenditures	35,660	35,660	—	—	114,017
Administrative expenditures	11,058	11,058	—	—	12,046
Facilities services expenditures	1,575	1,575	—	—	47,040
Auxiliary activities expenditures	114,270	114,270	—	—	—
Acquisition of plant and other (Note 9)	13,567	—	—	13,567	12,404
Property use and retirements (Note 9)	738	—	—	738	16,417
Retirement of indebtedness	5	—	—	5	—
Interest on indebtedness	15	—	—	15	—
Total expenditures and other deductions	<u>176,888</u>	<u>162,563</u>	<u>—</u>	<u>14,325</u>	<u>201,924</u>
Excess of revenue and other additions over expenditures and other deductions	<u>28,368</u>	<u>13,965</u>	<u>13,712</u>	<u>691</u>	<u>22,577</u>
TRANSFERS AMONG FUNDS— ADDITIONS (DEDUCTIONS):					
Mandatory principal and interest on notes	—	(20)	—	20	—
Nonmandatory for designated purposes, net (Note 10)	—	(5,579)	5,579	—	—
Total transfers among funds	<u>—</u>	<u>(5,599)</u>	<u>5,579</u>	<u>20</u>	<u>—</u>
Net increase for the year	28,368	8,366	19,291	711	22,577
Returned to U. S. Treasury	—	—	—	—	(173)
Fund balances at beginning of year	198,890	30,288	118,153	50,449	195,818
Fund balances at end of year	<u>\$227,258</u>	<u>\$ 38,654</u>	<u>\$137,444</u>	<u>\$51,160</u>	<u>\$218,222</u>

The accompanying notes are an integral part of these financial statements.

Federal funds			Totals, all funds	Totals, 1984
Operating funds	Construction funds	Capital funds		
\$173,141	\$18,326	\$ —	\$191,467	\$168,223
—	—	—	138,010	114,852
—	—	—	15,652	14,876
—	—	—	12,658	11,902
—	—	—	15,745	8,505
—	—	—	9,742	15,089
—	—	32,897	43,064	23,133
137	—	—	3,419	3,131
<u>173,278</u>	<u>18,326</u>	<u>32,897</u>	<u>429,757</u>	<u>359,711</u>
114,017	—	—	149,677	137,591
12,046	—	—	23,104	23,385
47,040	—	—	48,615	46,822
—	—	—	114,270	93,632
—	12,404	—	25,971	16,938
—	—	16,417	17,155	15,043
—	—	—	5	6
—	—	—	15	18
<u>173,103</u>	<u>12,404</u>	<u>16,417</u>	<u>378,812</u>	<u>333,435</u>
175	5,922	16,480	50,945	26,276
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
175	5,922	16,480	50,945	26,276
(173)	—	—	(173)	(102)
175	9,427	186,216	394,708	368,534
<u>\$ 177</u>	<u>\$15,349</u>	<u>\$202,696</u>	<u>\$445,480</u>	<u>\$394,708</u>

Smithsonian Institution Notes to Financial Statements

1. Summary of significant accounting policies

Basis of presentation

These financial statements do not include the accounts of the National Gallery of Art, the John F. Kennedy Center for the Performing Arts or the Woodrow Wilson International Center for Scholars, which were established by Congress within the Smithsonian Institution (the Institution) but are administered under separate boards of trustees.

The federal funds reflect the receipt and expenditures of funds obtained from Congressional appropriations. The accounts of the federal funds have been prepared on the obligation basis of accounting, which is in accordance with accounting principles prescribed by the Comptroller General of the United States as set forth in the *Policy and Procedures Manual for Guidance of Federal Agencies*. The obligation basis of accounting differs in some respects from generally accepted accounting principles. Under this method of accounting, commitments of the operating fund, such as purchase orders and contracts, are recognized as expenditures, and the related obligations are reported on the balance sheet even though goods and services have not been received as of the date of the financial statements. Such commitments aggregated \$39,147,000 at September 30, 1985. In addition, construction commitments amounted to \$18,279,000 at September 30, 1985.

The trust funds reflect the receipt and expenditure of funds obtained from private sources, federal grants and contracts, investment income and certain business activities related to the operations of the Institution.

Fund accounting

To ensure observance of the limitations and restrictions placed on the use of resources available to the Institution, accounts are maintained in accordance with the principles of fund accounting. This procedure classifies resources for control, accounting and reporting purposes into distinct funds established according to their appropriation, nature and purposes. 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.

The assets, liabilities and fund balances of the Institution are self-balancing as follows:

Federal operating funds represent the portion of expendable moneys available for support of Institution opera-

tions. Separate subfund groups are maintained for each appropriation as follows: Salaries and Expenses, Special Foreign Currency and Barro Colorado Island Trust Fund.

Federal construction funds represent that portion of expendable funds available for building and facility construction, restoration, renovation and repair. Separate subfund groups are maintained for each appropriation—Construction and Improvements, National Zoological Park, Restoration and Renovation of Buildings, Museum Support Center and the Center for African, Near Eastern, and Asian Cultures (Quadrangle).

Federal capital funds represent the value of those assets of the Institution acquired with federal funds and nonexpendable property transfers from government agencies.

Trust current funds, which include unrestricted and restricted resources, represent the portion of expendable funds that is available for support of Institution operations. Amounts restricted by the donor for specific purposes are segregated from other current funds.

Trust endowment and similar funds include funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and the income only be used. Also classified as endowment and similar funds are gifts which allow the expenditure of principal but only under certain specified conditions. Quasi-endowment funds are funds established by the governing board for the same purposes as endowment funds; however, any portion of such funds may be expended. Restricted quasi-endowment funds represent gifts for restricted purposes where there is no stipulation that the principal be maintained in perpetuity or for a period of time, but the governing board has elected to invest the principal and expend only the income for the purpose stipulated by the donor.

Trust plant funds represent resources restricted for future plant acquisitions and funds expended for plant. Pledges for the construction of the Center for African, Near Eastern, and Asian Cultures are recorded as gifts in the plant fund in the period the pledge document is received.

Investments

All gains and losses arising from the sale, collection or other disposition of investments and property are accounted for in the fund in which the related assets are recorded. Income from investments is accounted for in a similar manner, except for income derived from investments of endowment and similar funds, which is accounted for in the fund to which it is restricted or, if

unrestricted, as revenue in unrestricted current funds. Gains and losses on the sale of investments are recognized on the settlement date basis using the specific identification method, whereby the cost of the specific security adjusted by any related discount or premium amortization is the basis for recognition of the gain or loss.

Inventory

Inventories are carried at the lower of cost or market. Cost is determined using the first-in, first-out (FIFO) method, retail cost method (for those inventories held for resale) or net realizable value.

Deferred revenue and expense

Revenue from subscriptions to *Smithsonian Magazine* is recorded as income over the period of the related subscription, which is one year. Costs related to obtaining subscriptions to *Smithsonian Magazine* are charged against income over the period of the subscription.

The Institution recognizes revenue and charges expenses of other auxiliary activities during the period in which the activity is conducted.

Works of art, living or other specimens

The Institution acquires its collections, which include works of art, library books, photographic archives, objects and specimens, through purchase or by donation. In accordance with policies generally followed by museums, no value is assigned to the collections on the statement of financial condition. Purchases for the collections are expensed currently.

Property and equipment

Equipment purchased with federal funds is recorded at cost and is depreciated on a straight-line basis over a period of 10 years. Equipment purchased with trust funds for use by nonincome-producing activities is treated as a deduction of the current fund and a capitalized cost of the plant fund. Depreciation on equipment capitalized in the plant fund is recorded on a straight-line basis over the estimated useful life of 3 to 10 years (See Note 9). Capital improvements and equipment purchased with trust funds and utilized in income-producing activities are capitalized at cost and are depreciated on a straight-line basis over their estimated useful lives of 3 to 10 years.

Buildings and other structures, additions to buildings and fixed equipment purchased with federal funds are recorded at cost and depreciated on a straight-line basis

over a period of 30 years. Costs associated with renovating, restoring and improving structures are depreciated over their useful lives of 15 years.

Certain lands occupied by the Institution's buildings were appropriated and reserved by Congress for the Smithsonian and are not reflected in the accompanying financial statements. Property and nonexpendable equipment acquired through transfer from government agencies are capitalized at the transfer price or at estimated amounts, taking into consideration usefulness, condition and market value.

Real estate (land and buildings) purchased with trust funds is recorded at cost, to the extent that restricted or unrestricted funds were expended therefor, or appraised value at date of gift, except for gifts of certain islands in the Chesapeake Bay and the Carnegie Mansion, which have been recorded at nominal values. Costs of original building structures and major additions are depreciated on a straight-line basis over their estimated useful lives of 30 years. Costs of renovating, restoring and improving structures are depreciated on a straight-line basis over their estimated useful lives of 15 years (See Note 9).

Government grants and contracts

The Institution has a number of grants and contracts with the U.S. Government, which primarily provide for cost reimbursement to the Institution. Grant and contract revenue is recognized when billed.

Contributed services

A substantial number of unpaid volunteers have made significant contributions of their time in the furtherance of the Institution's programs. The value of this contributed time is not reflected in these statements.

Annual leave

The Institution's civil service employees earn annual leave in accordance with federal law and regulations. However, only the cost of leave taken as salaries is funded and recorded as an expense. The cost of unused annual leave at year-end is reflected in the accompanying financial statements as an asset and accrued liability in the federal funds.

Annual leave is recorded for trust employees in the trust fund as earned.

2. Related activities

The Institution provides fiscal and administrative services

to several, separately incorporated organizations in which certain officials of the Institution serve on the governing boards. The amounts paid to the Institution by these organizations for the aforementioned services, together with rent for Institution facilities occupied, etc., totaled approximately \$354,000 (\$281,000 for the trust funds and \$73,000 for the federal funds) for the year ended September 30, 1985. Deposits held in custody for these organizations are \$3,912,000 as of September 30, 1985.

The following summarizes the approximate expenditures of these organizations for the fiscal year ended September 30, 1985, as reflected in their individual financial statements and which are not included in the accompanying financial statements of the Institution:

	(\$000s)
Visions Foundation, Inc.	\$ 186
Reading Is Fundamental, Inc.	\$6,617
Woodrow Wilson International Center for Scholars:	
Trust funds	\$4,712
Federal appropriations	\$2,672

3. Cash on hand

Cash on hand—federal funds represents the amount of cash advanced by the U. S. Treasury to imprest fund cashiers for small purchases.

4. Fund balances with U.S. Treasury

The account represents fund balances on the books of the U. S. Treasury available for disbursement.

5. Investments

Investments are recorded at cost on a settlement date basis, if purchased, or estimated fair market value at date of acquisition, if acquired by gift. At September 30, 1985, investments were composed of the following:

	Carrying value (\$000s)	Market value (\$000s)
Current funds:		
Certificates of deposit	\$ 12,415	\$ 12,412
Commercial paper	7,585	7,600
U. S. Government and quasi- government obligations . . .	36,067	36,914
Corporate bonds	75	75
Common stock	13	5
Preferred stock	30	30
	<u>56,185</u>	<u>57,036</u>
Endowment and similar funds:		
Money market account	18,526	18,526
Deposit with U. S. Treasury . .	1,000	1,000
U. S. Government and quasi- government obligations . . .	9,474	10,410
Corporate bonds	3,754	3,266
Common stock	100,203	111,191
Preferred stock	3,384	3,092
	<u>136,341</u>	<u>147,485</u>
Plant funds:		
U. S. Government and quasi- government obligations . . .	26	27
Common stock	50	50
	<u>76</u>	<u>77</u>
	<u>\$192,602</u>	<u>\$204,598</u>

Since October 1, 1982, the deposit with the U. S. Treasury has been invested in U. S. Government securities at a variable yield based on market interest rates.

Substantially all the investments of the endowment and similar funds are pooled on a market value basis (consolidated fund) with each individual fund subscribing to or disposing of units on the basis of the per unit market value at the beginning of the month within which the transaction takes place. The unit value as of September 30, 1985, was \$223.18; 296,756 units were owned by endowment, and 364,248 units were owned by quasi-endowment at September 30, 1985.

The following tabulation summarizes changes in relationships between cost and market values of the pooled investments:

	(\$000s)		Net change	Market value per unit
	Market	Cost		
End of year . .	\$147,300	\$136,156	\$11,144	\$223.18
Beginning of year	\$131,113	\$116,860	<u>14,253</u>	203.92
Decrease in unrealized net gain for the year . . .			(3,109)	—
Realized net gain for the year			<u>13,525</u>	—
Total . . .			<u>\$10,416</u>	<u>\$ 19.26</u>

6. Endowment and similar funds

Endowment and similar funds at September 30, 1985 are summarized as follows:

	(\$000s)
Endowment funds, income available for:	
Restricted purposes	\$ 54,875
Unrestricted purposes	<u>4,538</u>
	<u>59,413</u>
Quasi-endowment funds, principal and income available for:	
Restricted purposes	19,073
Unrestricted purposes	<u>58,958</u>
	<u>78,031</u>
Total endowment and similar funds	<u>\$137,444</u>

The Institution utilizes the "total return" approach to investment management of endowment funds and quasi-endowment funds. Under this approach, the total investment return is considered to include realized and unrealized gains and losses in addition to interest and dividends. An amount equal to the difference between interest and dividends earned during the year and the amount computed under the total return formula is transferred to or from the current funds.

In applying this approach, it is the Institution's policy to provide, as being available for current expenditures, an amount taking into consideration such factors as, but not limited to: (1) 4¹/₂% of the five-year average of the market value of each fund (adjusted for gifts and transfers during

this period), (2) current dividend and interest yield, (3) support needs for bureaus and scientists, and (4) inflationary factors as measured by the Consumer Price Index; however, where the market value of the assets of any endowment fund is less than 110% of the historic dollar value (value of gifts at date of donation), the amount provided is limited to only interest and dividends received. The total return factor for 1985 was \$7.41 per unit to the Restricted and Designated Purpose Endowment Funds and \$5.50 per unit to the Unrestricted General Purpose Endowment Funds; new units were purchased for the Unrestricted General Purpose Endowment Funds with the \$1.91 difference in the total return factor. The total return applied for 1985 was \$2,880,000 to the Restricted and Designated Purpose Endowment Funds and \$1,416,000 to the Unrestricted General Purpose Endowment Funds.

7. Receivables

Receivables at September 30, 1985, included the following:

	(\$000s)
<i>Trust funds</i>	
Accounts receivable, auxiliary activities, net of allowance for doubtful accounts of \$881,000	\$11,899
Interfund receivables due from current funds:	
Endowment and similar funds	822
Plant funds	18,118
Interest and dividends receivable	2,104
Unbilled costs and fees from grants and contracts	1,081
Pledges	6,103
Other	<u>42</u>
	<u>40,169</u>
<i>Federal funds</i>	
Service fees and charges	<u>474</u>
Total, all funds	<u>\$40,643</u>

8. Advance payments

Advance payments represent prepayments made to government agencies, educational institutions, firms and individuals for services to be rendered or property or materials to be furnished.

As of September 30, 1985, the Institution had advances

outstanding to the U. S. Government of approximately \$13,902,000, principally for construction services to be completed in future fiscal years. The Institution at that date also had advances outstanding to educational institutions amounting to approximately \$1,255,000, principally under the Special Foreign Currency Program.

9. Property and equipment

At September 30, 1985, property and equipment which have been capitalized (see Note 1) are comprised of the following:

	<u>(\$000s)</u>	<u>(\$000s)</u>
<i>Federal</i>		
<i>Capital funds</i>		
Property	286,904	
Equipment	31,004	
Less accumulated depreciation	<u>(116,553)</u>	
Total, federal funds		<u>201,355</u>
<i>Trust</i>		
<i>Current funds</i>		
Capital improvements	\$ 4,699	
Equipment	6,828	
Leasehold improvements	235	
Less accumulated depreciation and amortization	<u>(5,340)</u>	
	<u>6,422</u>	
<i>Endowment and similar funds</i>		
Land	<u>239</u>	
<i>Plant funds</i>		
Land and buildings	\$ 31,550	
Equipment	2,985	
Less accumulated depreciation	<u>(6,862)</u>	
	<u>27,673</u>	
Total, trust funds		34,334
Total, all funds		<u><u>\$235,689</u></u>

Depreciation expense reflected in expenditures of the federal capital funds for 1985 was approximately \$13,181,000.

Depreciation and amortization expense for 1985 for trust

funds' income-producing assets amounted to approximately \$1,508,000, which is included in auxiliary activities expenditures in the current funds. Depreciation of trust funds' nonincome-producing equipment and buildings for 1985 amounted to approximately \$738,000.

During 1985, the trust unexpended plant funds were reduced by \$4,000,000 for a pledge deemed not collectible. The balance of the plant fund at September 30, 1985, included \$23,640,000 of trust unexpended plant funds.

10. Nonmandatory transfers for designated purposes

The following transfers among trust funds were made for the year ended September 30, 1985, in thousands of dollars:

	<u>Current funds</u>		<u>Endowment and similar funds</u>
	<u>Unrestricted</u>	<u>Restricted</u>	
Portion of investment yield appropriated (Note 6)	\$(1,350)	\$(1,086)	\$2,436
Income added to endowment principal	(4)	(139)	143
Endowment released	—	36	(36)
Appropriated as quasi-endowment	<u>(3,009)</u>	<u>(27)</u>	<u>3,036</u>
Total	<u><u>\$(4,363)</u></u>	<u><u>\$(1,216)</u></u>	<u><u>\$5,579</u></u>

11. Retirement plans

The federal employees of the Institution are covered by the Civil Service Retirement Program. Under this program, the Institution withholds from the gross pay of each federal employee and remits to the Civil Service Retirement and Disability Fund (the Fund) the amounts specified by such program. The Institution contributes 7% of basic annual salary to the Fund. The cost of the plan for the year ended September 30, 1985, was approximately \$6,575,000.

The Institution has separate retirement plans for trust and federal employees. Under the trust fund's plan, both the Institution and employees contribute stipulated percentages of salary which are used to purchase individual annuities, the rights to which are immediately vested with

the employees. The cost of the plan for the year ended September 30, 1985, was \$3,330,000. It is the policy of the Institution to fund plan costs accrued currently. There are no unfunded prior-service costs under the plan.

12. Income taxes

The Institution is exempt from income taxation under the provisions of Section 501(c)(3) of the Internal Revenue Code. Organizations described in that section are taxable only on their unrelated business income, which was immaterial for the Institution in 1985.

It is the opinion of the Institution that it is also exempt from taxation as an instrumentality of the United States as defined in Section 501(c)(1) of the Code. Organizations described in that section are exempt from all income taxation. The Institution has not yet formally sought such dual status.

SCIENCE

David Challinor, Assistant Secretary for Science

National Air and Space Museum

For the National Air and Space Museum (NASM), the year brought new challenges and manifold opportunities for innovation and change. The task of interpreting human endeavor in air and space requires the staff of the museum to work in the separate but related avenues of historical and scientific research. The museum's focus relates to the dimensions of past, present, and future. Diverse programs in research and writing, exhibitions, collections, education, and public outreach shaped the work of the museum during the year.

A well-developed program of research provides the base for all NASM activities. Responsibility for the program rests with the Office of the Associate Director for Research, which has been expanded this year to include a new Office of Aerospace Education and Publications. The office manages the museum's elementary and secondary education program, which also includes the docent program; the scholarly and popular publications program; and museum-wide special projects.

A second new office, the Office of University Programs, will expand the museum's cooperative programs with universities and research institutes. This year NASM hosted a cooperative program with New York University (NYU) on the theme the "History of Twentieth Century Technology." The seminar allowed both institutions to experiment with an innovative course of study integrating museum resources into the university curriculum. For example, a "historical replication" exercise with the Wright brothers' wind tunnel gave students the opportunity to grapple with the same problems that the Wright brothers encountered in the design of the first airplane—and with the same tools. Seminar sessions also dealt with remote-sensing technology and other aspects of aerospace technology. The seminar also included a one-day conference "The Museum as a Learning Center," sponsored by NASM, which was attended by representatives from local universities, museums, and the federal government.

The creation of the Martin Marietta Chair in Space History in 1985 represents an important addition to an already active NASM program of research fellowships. The first occupant of the new chair, Dr. Leo Goldberg, former director of Kitt Peak National Observatory in Tucson, is preparing his memoirs on American astronomy. An International Fellowship program was also established this year, with Peter W. Brooks of the United Kingdom as the incumbent. Brooks will research the history of the autogyro and its contribution to the initial development of the helicopter.

Dr. Hans von Ohain, NASM Lindbergh Professor of Aerospace History, wrote on his invention of the first jet

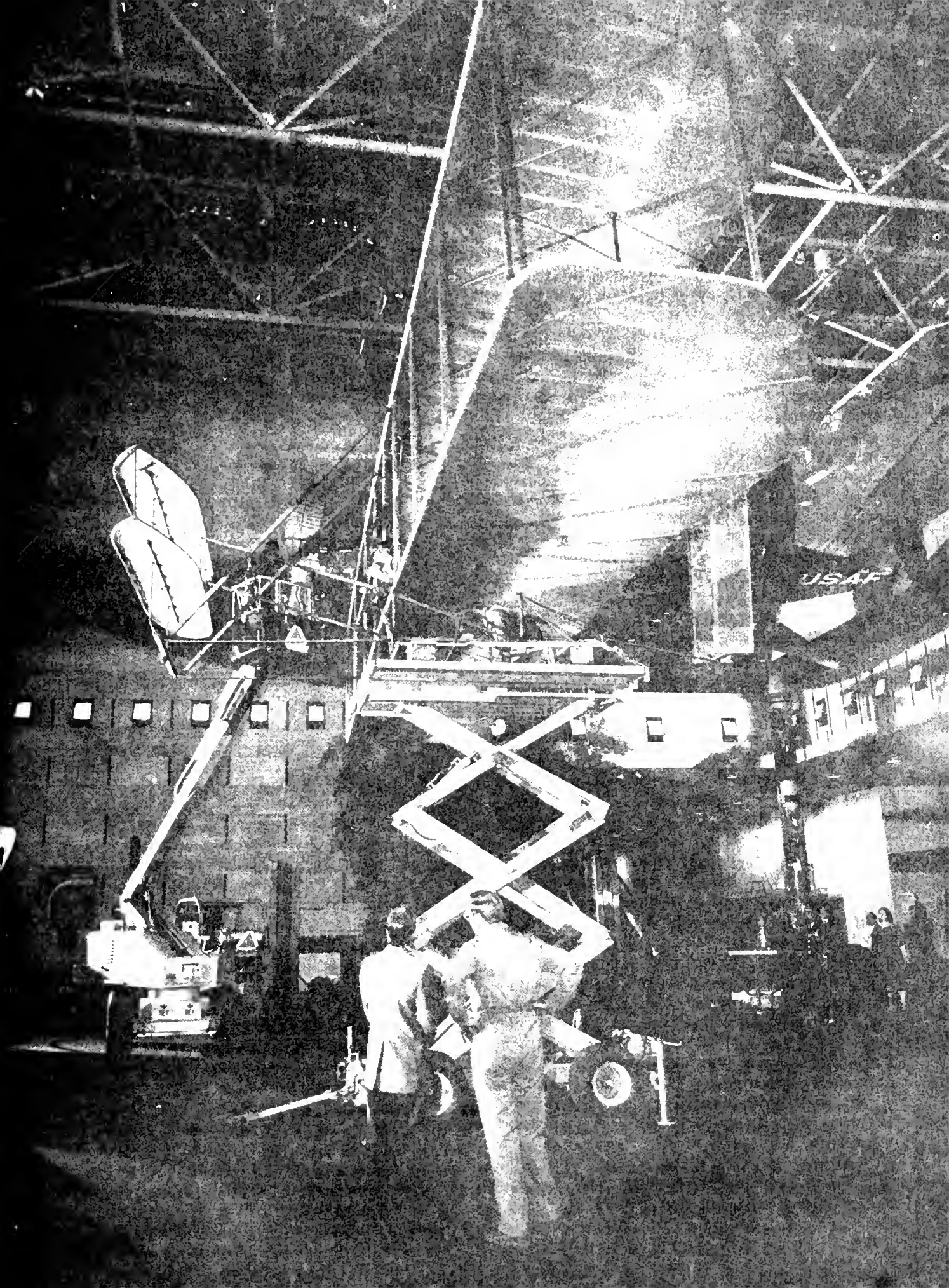
engine ever to power an aircraft. Dr. Richard K. Smith served as this year's Verville Fellow. His research centered on the new American airplane of 1934. In addition, NASM hosted eighteen interns and fellows during the year.

Individual NASM research programs are centered in three museum departments: Aeronautics, Space Science and Exploration, and the Center for Earth and Planetary Studies. Studies of the early history of flight and of the international implications of aerospace technology remain important themes for research and writing in the Department of Aeronautics. During the past year, staff members have continued the work of collecting, organizing, and translating the finest archive of original material relating to Russian aeronautics, 1900–1920, available in the United States. Curators continue to establish ties with foreign manufacturers and airlines. A special effort was made this year to focus on the collection of material relating to aerospace activity in Asia and in particular the People's Republic of China.

An exchange of letters between Secretary Adams and President Steven Muller of Johns Hopkins University, agreeing in principle to the establishment of a new collaborative Center for the History of Space Science, will help to focus important elements of the research efforts of the Department of Space Science and Exploration. The center will provide a program of training for scholars in the history of modern astronomy, astrophysics, and space science, and will generate a diverse program of seminars, publications, and scholarly exchanges.

The Space Telescope History Project, a joint enterprise of NASM and the History of Science Department of Johns Hopkins University to document the development of the Space Telescope, continues as a focal point for research within the department. More than two hundred hours of oral history interviews have been collected with past and present participants in the Space Telescope program. Several lectures have been given on the project's activities and findings, and three papers have been published, including one in a special issue of the Proceedings of the Institute of Electrical and Electronics Engineers on historical perspectives on the use of electronic instrumentation for the sciences.

Working late at night, craftsmen remove the 1903 Wright Flyer from its place of honor in the National Air and Space Museum's Milestones of Flight gallery. It was installed in an empty gallery where, behind transparent walls, the historic aircraft was carefully disassembled by a three-man crew, who spent the next five months preserving and restoring it.



NASM, the National Science Foundation (NSF), and the American Institute of Physics (AIP) cooperated to microfilm the AIP Sources for History of Modern Astronomy collection for official deposit at the museum. The acquisition of this collection, now complete and combined with the Space Astronomy Oral History Project Collection, makes NASM and the Smithsonian Institution the largest repository of oral history and archival materials on astronomy in the world.

Historical research continued on the history of space station concepts; a chronological narrative of the Congreve-Hale rocketry era during the nineteenth century; the beginnings of satellite science; the origins of space science in the V2 era, 1945-52; the development of the Apollo 11 spacecraft; the work of Konrad Zuse, who developed one of the world's first automatic digital computers; and the evolution of the space suit.

Scientific research in terrestrial and planetary geology and remote sensing continued at the Center for Earth and Planetary Studies (CEPS). Research in planetary geology included geologic mapping of Ganymede and the ongoing analysis of the extensive Tharsis ridge system of Mars as part of a continuing study of the tectonic evolution of the Tharsis Plateau. In conjunction with efforts to map these features on Mars, the anticlinal ridges of the Columbia Plateau in the northwestern United States are being studied as potential analogs to the Tharsis ridges, as well as to similar features on the Moon, Mercury, and possibly Venus.

As part of ongoing terrestrial research at CEPS, the study has continued of geomorphologic processes in the upper Inland Niger Delta of Mali, including the study of desertification processes as a result of twenty years of drought. Recently, this work has been expanded to a broader three-year study of erosion, aeolian transport, and the spectral characteristics of sands and soils in arid regions using diverse types of remote-sensing data, for three field areas in Mali, Egypt, and Botswana. Fieldwork was done in the deserts of southern Egypt and northern Sudan to study the terrain along the ground track overflowed by the Space Shuttle radar experiment, and in Mali to explore ancient river courses observed in satellite imagery. The Mali work will help determine the long-term effects of climate change on the fragile development of the inland Niger Delta region. Terrestrial research also included investigations of the use of thermal infrared data in conjunction with other types of remotely sensed data to locate and characterize lithologic units and large-scale tectonic features in Saudi Arabia.

Over the past year, CEPS continued to expand its com-



President and Mrs. Ronald Reagan, arriving for the June 19 premier of the National Air and Space Museum's newest large-screen film, *The Dream Is Alive*, are greeted by Walter J. Boyne (right), director of the museum, and Smithsonian Under Secretary Dean Anderson.

puter image processing capabilities with reference to image processing techniques and computer software for the analysis of remotely sensed orbital image data. The CEPS Regional Planetary Image Facility, a NASA-supported repository for images acquired during planetary missions, has begun acquiring Earth photography taken by Space Shuttle astronauts.

The year also saw significant advances in the program to improve and expand the NASM research archives. The first field test of the museum's System for Digital Display (SDD) for capturing archival documents via high resolution digital cameras was conducted at the Alabama Space and Rocket Center (ASRC) in Huntsville. Museum staff instructed ASRC staff in the use of the SDD equipment for capturing the personal papers of Wernher von Braun stored at ASRC. This pioneer project will provide NASM with much-needed data regarding reliability and practicality of the equipment in field trials. The system has been licensed by several commercial corporations in a wide variety of applications.

During 1985, NASM's analog videodisc project continued to progress with the acquisition of an additional camera. This resulted in a disc containing the U.S. Air Force World War II overseas collection of 50,000 images; it will be expanded to include an additional 50,000 images of pre-1953 U.S. Air Force photographs. The popularity of the museum's videodisc program resulted in an agreement with NASA to produce a disc containing its photograph collection. This disc, scheduled for completion early next year, will provide the museum with ready access to historical photographs of the U.S. space program.

The NASM publications program is a reflection of the

museum's commitment to quality research. The *National Air and Space Museum Research Report 1984* was the first volume in a series of annual publications. This report was distributed to scholars, universities, libraries, museum researchers, selected congressmen and their staff, and other interested persons throughout the country. The report reflects the strengthening of the museum's research and collection programs and exhibitions. Articles by staff and distinguished fellows are based on ongoing research at NASM or supported by the museum.

Other NASM publications released this year included *Moonlight Interceptor: Japan's "Irving" Night Fighter*, the eighth book in the Famous Aircraft of the National Air and Space Museum series; *United States Women in Aviation: 1930-1939*, sixth book in Smithsonian Studies in Air and Space; the third edition of *Aircraft of the National Air and Space Museum*; and *Airlines of Latin America Since 1919*. Two new catalogues were published: *Focus on Flight: The Aviation Photography of Hans Groenhoff*, and the *Space Astronomy Oral History Project Catalogue*. Reprinted NASM books included: *United States Women in Aviation through World War I*, *United States Women in Aviation 1919-1929*, *Winged Wonders: The Story of the Flying Wings*, and *The First 25 Years in Space*.

NASM books received more awards than ever before this year. *United States Women in Aviation 1919-1929* received an award of achievement from the Washington Chapter of the Society for Technical Communication (STC); the *Samuel P. Langley Theater* booklet and the *NASM Style Manual* each received an award of distinction from the STC. NASM received two honorable mention awards from the National Association of Government Communicators (NAGC) in their 1985 Blue Pencil Competition for the *Samuel P. Langley Theater* booklet and the *National Air and Space Museum Research Report 1984*. A special recognition award was presented by the Ohio Chapter of the Tuskegee Airmen to the museum for the outstanding graphic display in *Black Wings: The American Black in Aviation* publication. R. E. G. Davies' book, *Airlines of Latin America Since 1919*, won honorable mention (non-fiction category) from the Aviation/Space Writers Association.

Two NASM-produced brochures received awards from the STC: the Exploring Space lecture series brochure received an award of distinction, and the Apollo Legacy symposium brochure received an award of merit. An article on NASM's videodisc technology received an award of achievement from STC as well. In addition, the Apollo Legacy brochure won third prize from the NAGC Blue Pencil Competition. Articles on museum projects written

for the Smithsonian News Service were sent to more than 1,500 newspapers and magazines around the nation.

NASM cooperated on a series of twelve educational articles for the "Mini Page," a syndicated feature for children carried in 450 newspapers nationwide, with a possible circulation of more than forty million people. The series of articles for the "Mini Page" was coordinated by the Office of Aerospace Education and Publications.

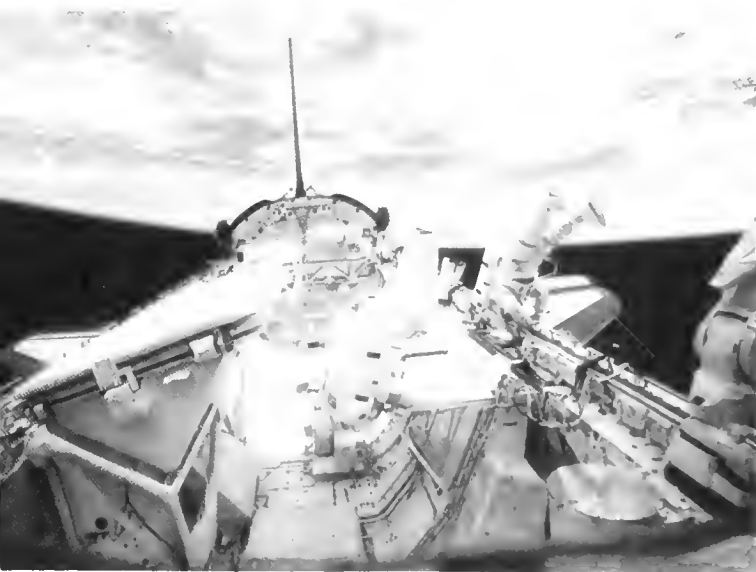
A new magazine, *Air & Space*, is being developed by the museum with the advice and cooperation of *Smithsonian* magazine. *Air & Space* will be written for the intelligent layman interested in the past, present, and future of all aspects of air and space. The magazine will feature thoughtful articles written with a human interest focus, extensive use of four-color photography, and explanatory diagrams.

The successful working relationship of NASM, Lockheed Corporation, IMAX Systems Corporation, and NASA created NASM's newest and well-received IMAX film, *The Dream Is Alive*. President Reagan attended NASM's premiere of the film on June 19. On June 21, 1985, the museum opened the film to the public. The film offers an insider's view of America's Space Shuttle program and features spectacular in-flight footage shot by fourteen astronauts. The film has set attendance records in the five other IMAX theaters currently showing it, as well as increased general attendance and other IMAX film attendance. By the first anniversary of its NASM premiere, the film will have shown in forty theaters around the world (of a possible forty-five).

IMAX rushes for *The Dream Is Alive* are being used by NASA for engineering purposes. NASA technicians are reviewing portions of the film to help them design the space station of the future; by watching the astronauts moving, eating, and sleeping in the film, NASA hopes to determine what works and what doesn't for future living and working in space.

On the Wing, NASM's IMAX/OMNIMAX film currently in production, is scheduled to premiere in the Langley Theater on June 19, 1986, exactly one year after *The Dream Is Alive*. The theme of the film is the endless quest for flight in nature and by human imitators.

Dr. Paul MacCready, designer of the Gossamer series of advanced flying machines, undertook to build a radio-controlled flying replica of *Quetzalcoatlus northropi*, a prehistoric reptile believed to have been the world's largest flying creature. He assembled a team of specialists in aerodynamics, technical engineering, and paleobiology. This flight will complete the last sequence of *On the Wing*. Even in the early planning stages, there has been wide



In the weightlessness of space, mission specialists Kathy Sullivan and David Leestma perform extravehicular activities during Space Shuttle Flight 41-G, *Challenger*, October 5-13, 1984. (Threshold Corporation)

media interest in the project.

A new multimedia show, *Comet Quest*, opened in the Albert Einstein Planetarium in November 1984. The show chronicles how comets have been studied in history, and sets the stage for Comet Halley's return to the inner solar system later this year. A small exhibition for this event, also titled *Comet Quest*, focuses on Edmond Halley. It also presents historical depictions of the comet and provides information on how and where the comet can best be viewed during its current return.

The goal of NASM exhibition effort is to present the history, science, and technology of flight in a manner understandable and enjoyable to visitors. Two separate exhibitions opened in the Special Aircraft Exhibits gallery. *Focus on Flight: The Aviation Photography of Hans Groenhoff and Rudy Arnold* featured photographs selected from the collections of these two world-renowned aviation and aerial photographers from the "Golden Age of Flight" era (1920-40); Mr. Groenhoff attended the opening of the exhibition. The Dayton-Wright built de Havilland DH-4 and the Northrop N-1M flying wing, recently restored by the craftsmen of NASM's Garber Facility, were exhibited along with supporting photographs and models.

The Pioneers of Flight gallery included two exhibitions. *Designers of the Jet Age* was based on the careers of two premier U.S. aircraft designers, Edward H. Heinemann

and Clarence L. "Kelly" Johnson; both designers attended the opening of the exhibition. *Early Flight 1900-1911* included fifty-six photographs from the Wright brothers' private collection, together with descriptive text and a poster. The exhibition was organized by Wright State University and sent on tour by the Smithsonian Institution Traveling Exhibition Service (SITES).

An exhibition of the work of contemporary sculptor John Safer opened in September, with pieces ranging in scale from architectural to intimate. A significant gift to the aeronautical collection was *Web of Space*, a sculpture donated by the artist. It will be awarded annually as the National Air and Space Museum Trophy.

Additions to major galleries included: the *Military Air Transport* exhibition in the Hall of Air Transportation covering the experimental period, starting in 1920, to the present day, including sections on the transatlantic airlift of World War II, the "Hump," the Korean and Vietnam wars, and various humanitarian activities of the Military Airlift Command. The flag presented to one of America's first military pilots, Henry H. "Hap" Arnold, in recognition of his attaining the rank of General of the Air Force, was added to the World War II Aviation gallery. New panels beneath the Voyager spacecraft and a final version of the film *Dynamic Worlds of Jupiter and Saturn* updated the Exploring the Planets gallery. Photographs and artifacts relating to the pioneer balloonist Thomas G. W. "Tex" Settle were added to the Balloons and Airships gallery. During the 1920s and 1930s, Tex Settle was a leading airshipman, balloonist, and space pioneer.

Smaller exhibitions this year included: *Aerial Firefighting*, presenting U.S. Department of Agriculture Forest Service uses of aircraft to fight fires, and a short film shot during actual operations in firefighting season on "smoke-jumping"; *Tooling Up for Space*, exhibiting the tools that were used to repair the Solar Max Satellite as shown in *The Dream Is Alive*. Another small exhibition was *Sight-seeing: A Space Panorama*, consisting of twenty-eight photographs from NASA on display in Space Hall. Significant aviation milestones are commemorated in a new Aerospace Anniversary Case in the Hall of Air Transportation. Commemorated this year were the 1905 flight of the Wright Flyer III to the founding of the European Space Agency ten years ago; and the fiftieth anniversaries of the first flight of the Boeing B-17 "Flying Fortress" and the first flight of the Douglas DST/DC-3.

The expansion of the NASM artifact preservation and restoration program of the museum's Paul E. Garber Preservation, Restoration, and Storage Facility (Garber Facility) remains a museum priority. The 1985 restoration of the

Wright Flyer represented an important milestone for the museum. Considerable research by the museum staff, supplemented by a detailed analysis of the aircraft by the Smithsonian's Conservation and Analytical Laboratory, preceded the restoration work. For the museum, there were accompanying benefits for future curatorial work: an expanded collection of photographs, many rare and hitherto undiscovered, of the Flyer; a definitive set of blueprints determined through staff research; recovery of the original 1903 crankcase; and myriad kinds of documentation. Future research and exhibit work, it is anticipated, will be enhanced by the enlarged body of information that grew out of the Wright Flyer restoration project.

Progress was made on preserving the large space suit and garment collection that has been in storage at the Garber Facility for many years. A complete restoration of the Applications Technology Satellite (ATS-6) is in progress. A NASM staff member led a restoration team, which included Rockwell International personnel, to refurbish the Apollo Command Module on loan to Moscow. The Wiseman-Cooke 1910 biplane was also restored this year at the Garber Facility. Restoration continues on the OS2U Kingfisher, the Arado 234 German jet, and the SPAD XIII.

Aircraft acquired for the aeronautical study collection included: a Piper J-2 Cub, the first to bear the Piper name; a Bell UH-1M Huey; an American Aerolights Eagle I; and the first certificated molded plastic airplane, the Windecker Eagle I. The museum's F6F Hellcat was restored by the Grumman Corporation and returned for the forthcoming exhibition on Leroy Grumman and the F6F. Two ultralight airplanes, the Sadler Vampire and the Paraplane, were also accessioned. In anticipation of the 1986 Looking at Earth gallery, a full-scale model of the Goes Geostationary weather satellite and two Landsat instruments, a thematic mapper replica, and a multi-spectral scanner were accessioned. Also, in anticipation of the upcoming computer gallery, an SEL 810 B computer was acquired, and a portable on-board computer from the Space Shuttle and a unitized electrical assembly that is a part of the Space Shuttle *Columbia's* on-board electronic system were accessioned.

NASM continues to offer a variety of educational programs and special events. The museum hosted a Career Awareness day for university deans and directors of planning and placement to increase the awareness by minorities of opportunities at the museum. The program attracted participants from local colleges and universities.

NASM supported National Science Week 1985, sponsored by NSF, for students and teachers. Activities at NASM included a planetarium program for local second-

ary students, a free showing of *Comet Quest*, and a lecture. In addition, two separate public lectures were held. The thirty-six winning entries of the Second Great International Paper Airplane Contest were exhibited for six months. The NSF supported the contest under the auspices of Science Week 1985. The contest was sponsored jointly by NASM, *Science 85* magazine, and the Museum of Flight in Seattle. The paper airplane carried into space and flown by Senator Jake Garn was also added to the exhibition.

The fourth annual Garber Facility Open House, "Wings and Things," continued to be one of the most popular and highly attended public events sponsored by the museum. The public was treated to self-guided tours, photo opportunities, music by the U.S. Air Force Band, and other special activities.

The world premiere of the NASM March, "Flight," was performed in November by the U.S. Air Force Band with actor William Conrad as guest narrator. In a continuing effort to involve both local residents and out-of-town visitors, a series of noontime concerts was held throughout the year, including the Fourth of July concert by the U.S. Air Force Band, broadcast live by WMAL/AM Radio. This year a new summer International Music Festival was begun, encouraging ethnic groups to perform at NASM.

During the year, the museum offered twelve General Electric aviation lectures; twelve Monthly Sky lectures; five Exploring Space lectures; the annual Wernher von Braun Memorial Lecture by Dr. Christopher Kraft, Jr., former director of NASA's Johnson Space Center; the annual Charles A. Lindbergh Memorial Lecture, delivered by Donald Engen, administrator of the Federal Aviation Administration; ten aviation films; eight space fiction films; and the international symposium on cooperation and competition in space: "Ten Years After Apollo-Soyuz," in conjunction with the tenth anniversary of the Apollo-Soyuz Test Project.

The past year presented a series of unique opportunities for the museum and its staff to enlarge its program of research, exhibitions, and public service. The momentum from this exceptional period of creative work sets the stage for the coming year, which will be the museum's tenth anniversary on the Mall.

National Museum of Natural History

The National Museum of Natural History / Museum of Man (NMNH/MOM), celebrating its 75th year in the Natural History Building in 1985, houses one of the world's largest and most valuable scientific collections, comprising approximately 100 million specimens of plants, animals, rocks, minerals, fossils, and man's cultural artifacts. This encyclopedic collection, which grows significantly in size every year, is an essential resource for the nation's scientific enterprise. Objects and artifacts are the responsibility of seven research and curatorial departments: Botany, Invertebrate Zoology, Entomology, Vertebrate Zoology, Paleobiology, Mineral Sciences, and Anthropology. The 120 doctoral level scientists on the museum staff work in collaboration with visiting scholars, students, research associates, and approximately 80 scientists from affiliated agencies accommodated in the museum. Most of the biological research is concerned with systematics and evolutionary biology. While much of the research is supported by unparalleled collections, field work is conducted regularly to fill in the huge gaps that still exist in the collections, especially those from the tropics. The results of this research are shared with the public through publications, lectures, and exhibitions—the latter viewed by approximately six million visitors annually. The museum's educational staff provides visitors with tours, films, and other learning experiences, some of them specifically designed for special groups, such as young people, the aged, and the disabled.

Diamond Jubilee of Natural History Building, 1910–1985

On March 17, 1985, the Natural History Building was 75 years old. The celebration began with a "Happy Birthday Natural History Party" for the public, organized by the Office of Education with the help of docents and volunteers. *The Natural History Building: A Visual Memoir*, an exhibition of some 90 historical photographs of the building was opened (March 15–May 31), and two permanent natural sculptures, consisting of a massive boulder of iron ore and an arrangement of two large petrified logs, were unveiled on the plinths that flank the steps up to the museum's main mall entrance. Special Jubilee souvenir posters and booklets, the first pictorial directory of the building staff, and an illustrated scholarly history of the building were produced. A major exhibition, *Magnificent Voyagers: The U.S. Exploring Expedition, 1838–1842*, was organized. It opened in the special exhibition gallery on November 14, 1985.

Festival of India Activities

Aditi: A Celebration of Life, created in New Delhi in 1978 to mark the International Year of the Child, was presented at the museum (June 4–July 28) as one of the major Smithsonian contributions to the nationwide Festival of India. *Aditi* used the multitude of craft, musical, and ritual activities that childhood inspires to provide an understanding of the world of the child in Indian culture. The special exhibition gallery was transformed for the occasion into a setting suggestive of a rural Indian village. On display were upward of 1,500 artifacts—contemporary, historical, regal, and popular—representing a broad range of traditional Indian handicraft and art created for children. To celebrate the many customs and rituals associated with children, forty folk artists from India, including dancers, singers, musicians, puppeteers, painters, potters, and jugglers, gave demonstrations and performances every day the exhibition was open. Some 125,000 visitors attended *Aditi*, including India's Prime Minister Rajiv Gandhi and First Lady Nancy Reagan. Office of Education programs to support this exhibition consisted of films, lectures, and group tours. More than 125 volunteers were recruited and trained by the education office to serve exhibition visitors. The office also developed a multimedia education packet to supplement studies of India in area schools. In conjunction with *Aditi*, two photographic exhibitions were mounted, *Rosalind Solomon, India* (June 4–August 31) and *Images of India: Photographs by Lala Deen Dayal* (June 4–August 31).

A Galaxy of Exhibitions

Views of a Vanishing Frontier (January 4–March 31), a traveling exhibition organized by the Joslyn Art Museum, Omaha, featured paintings and historical objects from the 1832–34 expedition to North America by German naturalist Prince Maximilian and Swiss artist Karl Bodmer. The Zale Diamond, an enormous uncut crystal weighing 980 carats, the largest diamond-in-the-rough in the world, and the fourth largest ever discovered, was lent by the owner for temporary display in the museum (November 22–January 6). *Gifts of Mother Earth: Ceramics in the Zuni Tradition* (June 15–March 31, 1986) was a comparative sur-

Workers install a huge boulder of banded iron ore from Michigan's Upper Peninsula at the Mall entrance to the National Museum of Natural History to mark the building's seventy-fifth anniversary.



vey of nineteenth-century and contemporary ceramics from the Zuni pueblo in western New Mexico, circulated by the Heard Museum, Phoenix, Arizona, in cooperation with the Zuni pueblo. The exhibition displayed many pieces from the pottery research collection acquired at Zuni pueblo in the 1880s by the Smithsonian Bureau of American Ethnology. *Drawn from the Sea, Art in the Service of Ichthyology* (September 13–December 31, 1985) was an exhibition of 200 fish illustrations predominantly produced for publication in Smithsonian and other U.S. government scientific studies. These works, many of them unpublished, dating from 1838 to 1980, were selected from the more than 10,000 drawings in the files of the museum's Division of Fishes. The division, part of the museum's Department of Vertebrate Zoology, is one of the oldest units of the Smithsonian. The Smithsonian Institution Traveling Exhibition Service will circulate a smaller version of the exhibition for three years, beginning February 1, 1986. *Birds of the Galapagos Islands: Traditional Watercolors* by Lee Marc Steadman (January 11–March 10) accurately and artistically portrayed characteristic Galapagos birds. *Mammals in the Limelight*, a permanent new exhibition hall focusing on the spectacular explosion of mammalian evolution in North America after dinosaurs died out 65 million years ago, opened on May 30. The hall's dramatic murals depict scenes of animal and plant life in successive epochs of the Age of Mammals and provide settings for hundreds of fossil specimens assembled from fossils unearthed in the past century and a half in the American West by scientists from the Smithsonian and other institutions. A microcosm of a Maine coastal ecosystem with live kelp, rockweed, marsh grass, lobsters, scallops, clams, mussels, pollock, and flatfish, housed in a 3,000-gallon aquarium system that uses a variety of electronic, mechanical, and biological devices to simulate natural conditions on Maine's rocky coastline, was placed on long-term display on June 28, adjacent to the living coral reef microcosm in the first floor Sea Life Hall. The two miniature environments complement each other, offering a comparison of warm-water and cold-water ecosystems and a demonstration of the way in which systems in microcosm are helping scientists better understand wild Marine environments. The development of the Maine ecosystem by the Smithsonian Marine Systems Laboratory (MSL), the same museum scientific team that devised the coral reef microcosm five years ago, was made possible by MSL research conducted in 1981–82 at Gouldsboro Bay, Maine, in cooperation with the University of Maine, with funding by the National Oceanic and Atmospheric Administration (NOAA). NOAA and Chevron U.S.A. Inc. provided addi-

tional funds for the construction of the Maine microcosm, which will be used for research and display in combination with the coral reef microcosm. *Blue Planet*, a 15-minute film produced by the Smithsonian Office of Telecommunications, is shown continuously in a small theater near the two microcosms. It shows MSL scientists conducting research on coastal ecosystems in the Caribbean and Maine, work that is pointing the way to new methods for managing and utilizing the ocean and aquatic resources of the Earth.

Natural Science Symposium

Three hundred twenty-five outstanding science students and seventy-five of their teachers from Washington, D.C., metropolitan area high schools participated in a three-day Natural Science Symposium at the museum, February 22–24, 1985. The goal of the symposium, the first of its kind ever held at the Smithsonian, was to give science teachers and promising junior and senior high school students from fifty-seven area public and private schools a glimpse of research in biology, earth science, and anthropology as it is conducted at a natural history museum. The program featured noted speakers, films, small discussion groups with museum scientists, and a behind-the-scenes tour. The event was planned by the museum's Office of Education and curators in cooperation with Washington, D.C., area high school science supervisors. Funding was provided by the Mars Foundation and the Elis Olsson Memorial Foundation.

Major Publications

Arctic, the fifth volume of the Smithsonian's projected twenty-volume encyclopedic *Handbook of North American Indians*, was published in December. Forty-three leading international authorities in anthropology, linguistics, and history contributed articles to the work, which focuses on the culture of the Eskimo and Aleut peoples of Greenland, Canada, Alaska, and Siberia. The volume was edited by David Damas of McMaster University. The complete *Handbook* is being published under the general editorship of Dr. William C. Sturtevant at the Smithsonian. *A Field Manual of the Ferns and Fern Allies of the United States and Canada*, written by botanist David B. Lellinger, was published in 1985 by the Smithsonian Institution Press. It is the first complete field guide of its kind in North America. Treating over 400 species, many of which are illustrated by

color photographs, the guide is expected to be an invaluable aid to scientists, horticulturists, and amateur botanists.

Notable Collection Acquisitions

The museum acquired the Small/Nicolay butterfly collection. With more than 100,000 specimens, consisting of many rarities and new species and subspecies, it is one of the premier collections of New World tropical butterflies. Another unique acquisition was the Brodzinsky/Lopez-Penha fossil amber collection. Of great interest to paleontologists, taxonomists, and zoogeographers, it consists of 5,000 pieces of amber containing rare fossilized insects and plants, a collection unmatched in any museum or private collection in the world.

Two New Research Programs: Studies of Global Volcanism and Caribbean Coral Reef Ecosystems Under Stress

With new funding received from Congress in 1985, the museum began to expand and streamline its volcanological data bank, making the stored historical information on volcanism available to scientists at the Smithsonian and other volcanological study centers via personal computers. The museum also began to expand its archive of maps, photographs, and other information important to understanding historical volcanism. One of the first products of the program, published in 1986, was a joint U.S. Geological Survey-Smithsonian map of the world's volcanoes and earthquakes. Efforts are also underway to enhance the operations of the Scientific Event Alert Network (SEAN), a museum organization that celebrated its tenth anniversary in 1985. SEAN compiles a regular report on current volcanism, based on reports of a global network of correspondents. This publication, disseminated through the geological and geophysical community, has been of great importance in stimulating research on active volcanoes.

The museum's ongoing study of the coral reef communities around Carrie Bow Cay, Belize, Central America, the most exhaustive and comprehensive long-term analysis of a Caribbean coral reef ever undertaken, was expanded in 1985 to include other Caribbean sites. Over the past twelve years, more than ninety scientists from the Smithsonian and museums and universities throughout the world have worked at Carrie Bow Cay on the virtually untouched barrier reef off Belize, second only in size to the Australian



Dr. Donald R. Davis, Museum of Natural History entomologist, examines a piece of fossil amber from a newly acquired collection of Dominican amber. Rare and unusually complete examples of fossilized insects and plants are contained in the 5,000 pieces of amber in this collection.

Great Barrier Reef. The present program has now reached a point where the knowledge gained from the Carrier Bow Cay studies can be applied to investigations of other reef areas, not only off Belize but in other locations of the tropical western Atlantic as well. Reefs, productive and diverse biological communities of considerable value to man, are under stress at various locations in the Caribbean as a consequence of disturbances caused by man, such as oil pollution, silting, and overfishing, and by natural factors, such as unusually low seasonal temperatures, hurricanes, and coral disease. The new comparative studies will form the basis for the development of an ecological model that will be used to predict the effects of natural and man-induced stresses on reef ecosystems throughout the Caribbean basin.

Another ongoing Caribbean project in 1985 was Acting Museum Director James C. Tyler's underwater habitat (Hydrolab) research in the Virgin Islands. Using saturated diving techniques, he is studying larval fish recruitment processes as factors in determining the patterns of a coral reef fish community.

Research in Africa on Human Evolution and Tropical Biology

Physical anthropologist Richard Potts is studying sites in Kenya at Lainyamok, Olorgesailie, Kanam, and Kanjera, where there are hominid fossils, stone artifacts, animal

bones, and other evidence of hominid activities in a time period ranging from one and a half to a half-million years ago. By looking at the changes that took place in these ancient ecological settings, possibly precipitated by some hominid activities, Potts hopes to increase understanding of the effect of ecological settings on human evolution.

Paleobiologists Anna K. Behrensmeyer and Scott L. Wing, in cooperation with colleagues at Harvard University and the University of Poitiers, France, in 1985 began a three-year study of Miocene age sedimentary deposits in the Republic of Cameroon, a region believed to be of great importance in hominid evolution. Initial field work at the site of an ancient lake, between eight to ten million years old, in the rift valley area of north-central Cameroon, yielded a large collection of fossil leaves and seeds that permitted a reconstruction of the Miocene paleoenvironment and paleoclimate—the milieu of hominid evolution. Analysis indicates that the Miocene vegetation of the area was a wet tropical forest, the first record of this fact.

The Smithsonian's African small mammal collection, containing more than 100,000 specimens, is a principal reference in the world for establishing the distribution and types of African rodents and other small mammals and their ectoparasites. Although West African mammals are generally well represented in the collection, there was little from Sierra Leone, a regrettable omission, as knowledge of species occurrence in this area is critical to understanding broad patterns of mammalian speciation on the African continent. The first efforts to fill this zoogeographic void were undertaken recently by mammalogist Michael D. Carleton in a survey of the vertebrate fauna in the Outamba-Kilimi National Park, situated in remote and relatively undisturbed northern Sierra Leone. Led by Carleton, a Smithsonian field team, funded by the Smithsonian's Scholarly Studies Program, spent two months at the Park conducting a small mammal census. Carleton is now studying the taxonomic status, phylogenetic relationships, ecology, and zoogeographic affinity of the rodent genera collected, as a framework from which to examine broader patterns of distribution and phylogenetic diversification especially among forest-dwelling rodents.

Because of his authoritative knowledge of the mountainous forest flora of Kenya, botanist Robert B. Faden was invited in May on a National Museums of Kenya expedition to the Tatia Hills. On the upper slopes of these Kenyan mountains are remnant forest patches containing numerous endemic and rare plant and animal species. The forests are now being cut for timber and firewood, hence the urgency of the expedition, which was charged with making a conservation proposal. The expedition assessed

the current status of the forest and made collections—including a previously undescribed species of coffee—to document the disappearing vegetation.

Mediterranean Research

Erosion of the Nile Delta has increased considerably since the construction of the Aswan Dam, with potentially dire future consequences for Egyptian agricultural production. Working in cooperation with the Egyptian Coastal Protection Institute and Italian and French colleagues, geological oceanographer Daniel J. Stanley began coring in September–October 1984 to define the Holocene sediments on the northeastern area of the Delta. Of particular interest are rates of Nile Delta subsidence and erosion, changes in the Nile River distributary system, and changes in the configuration of the coastline. This project is being funded by grants from Texaco and the Smithsonian Scholarly Studies Fund.

Native American Studies

New evidence that domesticated crops were being cultivated by eastern North American Indians long before the introduction of maize from Mexico was documented in an October 1984 issue of *Science* by museum archeologist Bruce Smith. The discovery is a case history of how an object in the museum's collections, carefully preserved for many years, can be restudied with the aid of advanced technology and yield important scientific information. Smith, searching the collections for evidence of prehistoric horticultural practices, discovered a mass of carbonized seeds in a charred saucer-shaped basket unearthed in 1956–58 Smithsonian excavation of Russell Cave in Alabama, a site where a ten-millennium-long sequence of intermittent human occupation is documented. The seeds were identified as *Chenopodium berlandieri*, a starchy-seeded native North American plant. In the 1950s the archeologist who thought to save the basket of seeds could neither date them nor ascertain their wild or domesticated status, but in the intervening years methods to determine both have developed. Smith sent the mass of 50,000 seeds to the Smithsonian Radiocarbon Dating Laboratory where a sample was determined to be 1,975 years old, plus or minus 55 years. Using one of the museum's scanning electron microscopes, Smith compared the seeds from Russell Cave to both a modern domesticated chenopodium variety from Mexico and to modern wild eastern North American species, and

he found that his seeds exhibited several of the distinctive morphological characteristics associated with the modern domesticated chenopodium. It is not known whether this early domesticate was introduced from Mexico or was the product of an independent process of domestication, but Smith's work establishes that this starchy-seeded domesticate was being stored and planted in prehistoric Woodland Indian garden plots by about 2,000 years ago.

Return Expeditions to Cerro de la Neblina and Aldabra

Cerro de la Neblina, the largest and most scientifically interesting of the isolated sheersided mesas, known as tepuis, in southeast Venezuela's "Lost World" region, is the focus of a major international study. Flown by helicopter to the top of Neblina, nearly one hundred scientists from the Smithsonian and other major research institutions were able to study and collect for the first time in 1984-85 many of the unique plants and animals that have evolved on this high cloud-shrouded tepui. Museum entomologists Terry Erwin and Paul Spangler and botanist Vicki Funk were among nine museum scientists who made large collections of rare and undescribed taxa during a month's visit to Neblina in early 1985. With their return in March, the fieldwork is nearly complete. Major scientific publications are planned with contributions by the expedition participants.

Aldabra, a giant coral atoll in the southwestern Seychelles Islands, is as remote and difficult to reach as Cerro de la Neblina, and equally as interesting biologically. Museum scientists launched a long-term collaborative study of this remarkable ecological system in 1983, sending out a highly successful expedition to the atoll. A second expedition was turned back in 1984 because of stormy weather in the Indian Ocean—the atoll is accessible only by ship—but in March 1985 a group of eight scientists and technicians, led by the museum's Brian Kensley, reached the atoll and was able to spend three weeks there, assembling large and significant collections of the atoll's unique flora and fauna and gathering valuable research data on the colony of giant tortoises.

Algal Research at the Smithsonian Marine Station at Link Port

Under the administration direction of the museum, twenty scientists from the museum and the Smithsonian Environmental Research Center, along with their colleagues from other institutions, in 1985 utilized the Smithsonian Marine

Station at Link Port to conduct marine biological research. The facility is located on the Indian River on the east coast of central Florida near Fort Pierce, not far from the Atlantic Ocean, within the complex of the Harbor Branch Foundation, Inc., a not-for-profit organization for research in the marine sciences. Several marine botanical projects are currently in progress, including continuing study and analysis of deep-water plant life discovered in 1984 on an uncharted sea mount off San Salvador Island in the Bahamas, utilizing the Johnson Sea-Link submersible of the Harbor Branch Foundation, Inc. The studies are a collaborative effort of Mark M. Littler, Diane M. Littler, James N. Norris, Katina E. Bucher, all of the museum, and M. Dennis Hanisak and Stephen Blair of the Harbor Branch Foundation. Thus far they have described a rich assemblage of unique plant life on the sea mount, as well as the deepest known records for autotrophic plant life, at a depth of 268 meters. The ambient light levels at this depth were one-hundredth of the theoretical minimum needed for plant life to survive. The studies are continuing with the further objectives of discovering new forms of plant life in the deep sea and ascertaining their potential roles in primary productivity, food webs, sedimentary processes, and as reef builders on tropical insular and continental borderlands.

Oceanographic Sorting Center Now Located at Museum Support Center

The Museum Support Center (MSC), administered by the museum, completed its second full year of operation. Covering four and one-half acres of land at Silver Hill, Maryland, the MSC is devoted exclusively to collections management, providing optimum conditions for the storage, care, and study of Smithsonian collections. The storage system in the MSC designed to contain biological collections preserved in solutions was completed in 1985, and the physical move of those collections from the Mall was accomplished successfully. Concomitant with this move was the corresponding increase in the utilization of the laboratories supporting the management and research of these collections, most notably the move of the Oceanographic Sorting Center to the MSC from its previous residence within the Washington Navy Yard. The Sorting Center, administered by the museum, carried out basic classification of animals and plant materials collected on oceanographic expeditions sponsored by various organizations and Federal agencies. These materials are distributed to scientists around the world concerned with the study of marine organisms.

National Zoological Park

The National Zoological Park (NZN) is dedicated to education, science, recreation, and conservation.

Animal Collection and Exhibits

The Invertebrate, Herpetology, Ornithology, and Mammalogy departments had a collection of 2,017 animals for public exhibition and education. There were more than 350 births and hatchings, including numerous reptiles, amphibians, birds, and mammals. Among the mammals born were giraffe, pygmy hippopotamus, sea lion, hammer-headed and big fruit bats, red panda, and white-cheeked gibbon and siamang. Births contribute to international breeding programs for endangered species.

Two female North American bison were added to the exhibits. This species, part of the original NZN collection, symbolizes the contribution of zoos to conservation. Asian lions added to the collections are part of a cooperative breeding plan for this cat.

Major renovations took place in the Bird House where red-billed hornbills and black-palm cockatoos occupy entirely new exhibits. A very popular invertebrate display opened in the lobby of the Education/Administration Building; this is the forerunner of a major exhibit planned for 1986. A new bat exhibit has become another favorite of Zoo visitors. Extensive plantings of specially chosen flowers are luring masses of butterflies to the Zoo.

Dr. Edwin Gould, curator of Mammals, continued his research on regurgitation and other stereotypic behavior in gorillas; he discovered that adding browse in the form of leafy tree branches virtually eliminates regurgitation. Collection Manager Elizabeth Frank cooperated with NZN veterinarians and researchers in using hormone injections to stimulate ovulation in Ling-Ling, the female giant panda. Collection Manager William Xanten collaborated on an artificial insemination program for ringtailed mongoose. Dr. John Seidensticker (Department of Mammalogy) conducted behavioral studies of the Zoo's leopards and Asian lions; these and other studies yield information that will promote captive breeding. Dr. Benjamin Beck, research primatologist, continued to develop techniques for preparing captive-born golden lion tamarins for introduction to the wild.

Dr. Dale Marcellini, curator of herpetology, collaborated with scientists at other institutions in studies on the niches of Cuban anolan lizards and curly-tailed lizards in Haiti. Research by Reptile House keepers resulted in the successful rearing of pythons, boas, and several frog species.

Charles Pickett, assistant curator of ornithology, in collaboration with a variety of agencies and the government of Pakistan, worked to plan a new national zoo for Islamabad, Pakistan. Collection Manager Paul Tomassoni led Bird House keepers in an avicultural research program involving bower bird and sun bittern breeding, food delivery systems for waterfowl, and hand-rearing techniques.

Conservation

The Department of Conservation (DOC) located at NZN's Conservation and Research Center (CRC) in Front Royal, Virginia, is dedicated primarily to the propagation of vertebrate species threatened with extinction. Research and breeding programs carried out in collaboration with other NZN departments and other institutions are aimed at increasing knowledge of animal management, conservation biology, and basic biology.

In 1985, Mr. Guy Greenwell, senior ornithologist, retired. Dr. Wemmer presented an invited paper at a workshop on black-footed ferrets in Wyoming and visited Nepal and India to consult on ungulate-habitat relationships in Royal Chitwan National Park, Nepal; he also continued studies on the population biology of domestic elephants. Dr. Derrickson presented two papers at the 1985 Crane Workshop in Nebraska. SI Research Associate Dr. Joel Berger continued field studies on the social behavior of American bison. Drs. Wildt, Bush, Phillips, Wemmer, and Collection Manager Larry Collins started research into the collecting, freezing, and transferring of embryos in non-domestic hoofed stock. Aspects of the behavior of the Guam rail and Micronesian kingfisher are being investigated by Drs. Moynihan (STRI), Morton, and Derrickson.

During the year, the Center hosted over 200 visiting scientists, students, and other official visitors. Dr. Rudran's Wildlife Conservation and Training course was again held at the Center, and included sixteen overseas participants. NMNH, STRI, SERC, and NZN personnel visited the Center in conjunction with the Interbureau Tropical Biology Conference.

A number of notable events at the DOC this year include: the birth and successful rearing of two tiger quolls—the first recorded captive breeding of this species outside Australia; and the birth of many highly endangered mammals and birds including Père David's deer (the tooth fawn born at the Center), Goeldi's marmoset,

Hsing-Hsing (*top*) and Ling-Ling play on their furniture at the National Zoo during breeding season.





Wielding shovels at the Olmstead Walk ground-breaking ceremony, August 19, 1985, are (left to right) Dr. Roscoe Moore, president of the Friends of the National Zoo; David Challinor, Assistant Secretary for Science; John Jameson, Assistant Secretary for Administration; Michael Robinson, director of the National Zoo; and David McCullough, host of "Smithsonian World."

golden-lion tamarin, maned wolf, clouded leopard, Eld's deer, Persian onager, Laysan teal, Guam rail, Micronesian kingfisher, and Bali mynah.

At the DOC, construction of the new Small Animal Facility was completed, and the new Animal Hospital is currently under construction and nearing completion.

Education and Public Affairs

For the Zoo's Office of Education (OE) conservation education was a primary focus in 1985. Through two major efforts—"A Tropical Forest Festival" for the public and a zoo educator's workshop on "Conservation and the Zoo Visitor"—OE continued to investigate methods to educate visitors about worldwide conservation issues.

In June 1985, OE organized "Summerfest 85: A Tropical Forest Festival." Through storytellers, music, dance, mime, mural painting, animal demonstrations, and a special "Tropical Pursuit" conservation game, visitors were made aware of the importance of tropical forests and the

reasons they should be preserved.

Ongoing school programs continued to be extremely successful, and several new programs were developed including a special small mammals program led by keepers, for pre-kindergarten through the sixth grades. New high school curriculum units, Primate Behavior and Zoo Design, were developed to stimulate greater high school teacher and student use of zoo facilities.

The Office of Public Affairs (OPA), besides providing general information on Zoo programs and activities to the public and media, also organizes the annual NZP Symposium for the Public. This year the symposium program received a Significant Achievement award from the American Association of Zoological Parks and Aquariums (AAZPA). The proceedings of the first public symposium, *Animal Extinctions*, edited by Dr. Robert Hoage, was published by the Smithsonian Institution Press.

OPA and The Friends of the National Zoo (FONZ) cosponsor a Wildlife Studies Certificate Program in which wildlife enthusiasts can obtain a certificate by completing six courses. To date, thirty classes have been offered on a variety of subjects with nearly 425 participants.

OPA produced and coordinated a series of eight summer concerts, the Sunset Serenades. These attracted between 400 and 700 people for each concert with family groups being most numerous.

Animal Health and Pathology

The Department of Animal Health (DAH) provides veterinary care for the NZP animal collection both at Rock Creek and CRC. The clinical staff participates in research and technique development; conducts postgraduate training; publishes extensively; and participates in continuing education all to advance zoological medicine. International programs include participation by Drs. Bush and Wildt in immobilization-reproductive-genetic studies in Kenya and Tanzania.

Extensive efforts continued in physiological and endocrinological research that emphasizes the comparative study of nondomestic and domestic animal models. During the past year new procedures were formulated for long-term banking of both spermatozoa and embryos. Considerable progress was made in initiating an embryo recovery and freezing program involving the scimitar-horned oryx herd from the CRC. This program is directed by Dr. Wildt and conducted by collaborators at the National Institutes of Health and the Uniformed Services University of the Health Sciences.

Clinical research directly applicable to veterinary care of zoo patients includes diagnostic studies of *Mycobacterium* spp., rabies prophylaxis and vaccination response in mammals, monoclonal killed canine distemper vaccines, appropriate anthelmintics for reptilian parasites, and adrenal response to immobilization and surgical manipulation in selected primate, ungulate, and carnivore species. Studies of zoo animal viruses and vaccines, especially those involving canine distemper and rabies, were funded by Charles Ulrich and Josephine Bay Foundation through the American Association of Zoo Veterinarians.

The Department of Pathology (DOP) engages in applied research and teaching in addition to diagnostic services. Research continues to center around disease problems in the collection, with emphasis on the development of prophylactic measures.

Ongoing projects include a collaborative project with Dr. Oliver Ryder (Zoological Society of San Diego) and Dr. George Allen (University of Kentucky) on the prevalence of the EHV-1 virus in a variety of exotic equids, including the NZP Przewalski horse herd; and Dr. Don Nichols' work on atherosclerosis as a natural disease in birds and the effect of captive diets on this.

Dr. Montali and his staff have continued their training of individuals at several levels. Preceptorships were completed by Monique Wells and Christine Plowman. Vera Bonshock, Anne Bratthauer, and Donna Fischer supervised a summer program for high school students, Susan Ingraham and Benjamin Fishman, sponsored by the American Cancer Society.

Research

The goal of the Department of Zoological Research (DZR) is to provide scientific support and creative innovation for the research, conservation, and education missions of the NZP.

A primary function of DZR is to promote collaboration in research on general problems. Programs have ranged from long-term field studies in many areas of the world and involving many scientists, to one-on-one collaborations in testing a specific hypothesis. Current collaborative projects include twenty-one with staff in other NZP departments, five with other SI bureaus, thirty-nine with universities, and twenty-eight with other institutions, including zoos.

Research projects in 1985 include: the rehabilitation and training of captive-born golden lion tamarins prior to their reintroduction in the Poço das Antas Reserve and else-



Some of the eleven black-tailed prairie dogs born in the spring of 1985 at the Zoo try the great outdoors.

where in Brazil which has involved monitoring animals which had been released in 1984 as well as young born to released captive-born parents. In 1985 two more groups were released outside of the Reserve, one with and one without training. Drs. Benjamin Beck and Devra Kleiman and several Brazilian students worked with those animals to train them in techniques of foraging and finding new foods, and locomotor and orientation behavior. Dr. James Dietz continued studies of the behavioral ecology of wild golden lion tamarins to determine their feeding habits, home range and movements, and social organization. Lisa Forman visited Brazil to collect tissue and blood samples for her studies of the genetic relationships among the three forms of lion tamarins and within the captive and wild population of golden lion tamarins. Initial results suggest that lion tamarins show little genetic variation. Andrew Baker started studies on the effects of age, sex, and status on the behavior of golden lion tamarins in intergroup encounters. Lou Ann Dietz has been coordinating a local and national educational program in Brazil concerning conservation of golden lion tamarins.

Dr. Rudran conducted wildlife management training courses in Sri Lanka and Venezuela. Dr. Eugene Morton continued his research program on the evolution of animal vocal communication, including collaborative studies with

Dr. Eyal Shy on the evolution and function of bird song. Dr. Morton and Dr. Russell Greenberg continued collaborative studies on the development of feeding and foraging behavior in migratory birds relating the differences in behavioral development of species to their feeding adaptations and habitat selection as adults. Dr. Morton continued his involvement with conservation of migratory birds through the evaluation of habitat along typical bird migration routes.

Dr. Katherine Ralls continued her studies of sea otter behavioral ecology, and with Dr. Donald Siniff of the University of Minnesota radio-tracked and followed the behavior of several male sea otters living in an all-male bachelor group.

Dr. Steven Thompson continued studies of the comparative energetics of eutherian and marsupial mammals. This research will focus on the changes in the metabolism of marsupials and eutherian mammals during the course of the reproductive cycle. Dr. Theodore Grand continued his studies of the relationship between anatomy, morphology, and behavior.

Dr. John Gittleman, postdoctoral fellow, continued his work on red panda development and vocalizations and in collaboration with Dr. Olav Oftedal and Dr. Kleiman studied behavioral development and lactation in black bears.

Dr. Oftedal and Dr. Daryl Boness completed their project on hooded seal lactation and milk composition, and continued long-term studies of behavioral development, lactation, and the effects of El Niño on reproductive success in the California sea lion, together with Dr. Katherine Ono. Mary Allen continued her studies of insect-eating animals and captive diets. Dr. Susan Crissey started a joint analysis between DZR and CRC of milk composition during development in several cervid species. Dr. Wolfgang Dittus and Anne Baker-Dittus continued long-term study of Toque macaques of Sri Lanka.

Dr. Kleiman continued studies of the social and reproductive behavior of giant pandas.

Construction and Support Services

The Office of Construction Management (OCM) completed renovation of a number of exhibits. Olmsted Walk was redesigned to reflect, enhance, and preserve the natural and historic character of the Zoo. Construction of Phase I in the lower third of the Park began in August 1985. Other major design projects include a veterinary hospital at Rock Creek, and invertebrate and gibbon exhibits. The



A golden lion tamarin named Lancelot raises his voice in a call. He was one of the animals sent to Brazil as part of the reintroduction project.

veterinary facility at CRC was completed and design of a consolidated maintenance facility begun.

The Office of Facilities Management (OFM) continued its important role of maintaining the Zoo's property and supporting the animal programs. Two exhibits (prototype invertebrate enclosures in the Education Building and the Festival of India area in the Reptile House) were constructed by OFM and the Office of Graphics and Exhibits (OGE) personnel. Support of over thirty-five special events was provided with everything from evening lighting to the construction of a permanent entertainment platform.

OGE designed and produced a brochure for the Wildlife Conservation and Management Training course and a poster featuring endangered species. Experimental education graphics for the prairie dog and hippo exhibits were also undertaken.

A scratching tree was fabricated for the African elephant and banners once again announced the start of the summer season. OGE continued to support Summerfest, FONZ ZooNights, Sundays at the National Zoo, Sunset Serenades, Seal Day, and the annual symposium.

Park security and enforcement remain high with the

Friends of the National Zoo

Financial Report for the Period January 1–December 31, 1984
 [In \$1,000s]

	Net revenue	Expense	Net increase/ (decrease) to fund balance
Fund Balance @ 1/1/84			\$1,412
Services			
Membership	\$ 592	\$ 485	107
Publications	142	149	(7)
Education ¹	97	697	(598)
Zoo Services ²	4,319	3,558 ³	761
Totals	<u>\$5,150</u>	<u>\$4,889</u>	<u>\$ 263</u>
Fund Balance @ 12/31/84			<u>\$1,675⁴</u>

¹Excludes services worth an estimated \$358,700 contributed by FONZ volunteers.

²Includes gift shops, parking services, and food services.

³Includes \$425,193 paid during this period to the Smithsonian Institution under contractual arrangement.

⁴Net worth, including fixed assets, to be used for the benefit of educational and scientific work at the National Zoological Park.

added surveillance of five new closed-circuit television cameras, assisting the Office of Police and Safety (OPS) in providing protective services. The Safety Unit continues its efforts to reduce employee lost-time accidents and improve visitor safety. Increased Park-sponsored events challenge OPS's resources, but innovations such as employee occupational safety training programs, the use of part-time officers, and fire detection and suppression efforts keep the Zoo a safe place to visit and work in.

Friends of the National Zoo

The Friends of the National Zoo (FONZ) enjoyed their most successful years ever in 1984 and 1985 with support of Zoo efforts in education, conservation, and research. Volunteer contributions expanded substantially. With leadership from the regular core of more than 600 volunteers, a force of 750 persons spent 7,000 man hours to build structural play furniture for the giant pandas, completing the project in four days. The second National Zoofari, an outdoor evening entertainment and silent auction planned by

FONZ directors, produced a \$45,000 addition to the Theodore H. Reed Animal Acquisition Fund. Grant support of NZP-directed wildlife studies reached \$428,000 in 1985. In 8,404 hours of attending the NZP Hand Rearing Facility volunteers had numerous successes in the care of mammals and birds, including the first rearing of a cusimanse (African mongoose).

FONZ staff managed over 50,000 hours of volunteer operations of a dozen education and information services. The first class of eleven teenage Senior Zoo Aides became qualified to assist curators and keepers in animal care. The ZooNight attendance was 18,000 members and families. Members planted additional flower gardens and donated funds for fifty new benches.

Services for visitors grew in 1985 with improvements in food display, addition of snack carts, training and uniforming of traffic aides, and changes in management procedures.

Financial information for calendar year 1984 is given below. A percentage of revenues from Zoo Services is paid to the Smithsonian for the benefit of the National Zoo and is reported as income by the Institution.

Office of Fellowships and Grants

The Office of Fellowships and Grants (OFG) continues to serve as an Institutional link with scholarly organizations throughout the world. The Office encourages research by persons from universities, museums, and research organizations in the fields of art, history, and science. It brings scientists and scholars to all parts of the Smithsonian to utilize the unique resources available, as well as to interact with professional staff. At present, two major activities are managed and developed by the office: Academic Programs and the Smithsonian Foreign Currency Program (SFCP).

Academic Programs at the Smithsonian support and assist visiting students and scholars. They provide opportunities for research to be conducted at Smithsonian facilities, in conjunction with staff members. Residential appointments are offered at the undergraduate, graduate, and professional levels.

The Institution further enhances the quality of its research and also extends the reach of its scholarly efforts through the Smithsonian Foreign Currency Program. The SFCP offers grants to the Smithsonian and other U.S. scholarly institutions to conduct research in a limited number of foreign countries where "excess currencies" are available. It is particularly effective in strengthening the "increase and diffusion of knowledge" on an international scale.

Academic Programs

The Office of Fellowships and Grants administered a variety of academic appointments in 1985. The program of Smithsonian Research Fellowships was begun in 1965. This year seventy-one predoctoral, postdoctoral, and senior postdoctoral fellowships were awarded. These appointees pursue independent research projects under the guidance of staff advisors for periods of six months to one year in residence at one of the Institution's bureaus or field sites. Topics of study for Smithsonian Fellows included: the structure and organization of the free Black community in Richmond, Virginia; a test of dental microwear analysis in reconstructing diets of prehistoric populations; the influence of English art and aesthetics on American sculptors in Italy from 1825 to 1875; analysis of excavated printers' type; the interactions of leaf phenology and insect herbivory; and the xenogenous fertilization of leopard cat (*Felis bengalensis*) oocytes.

Twenty-six graduate student fellowships were offered for ten-week periods during 1985. The participants are usually junior graduate students beginning to explore avenues that develop into dissertation research. This year

some of these fellows studied: shrimp from deep-water traps off the south and west coasts of Puerto Rico; similarity of song in neighboring versus non-neighboring Kentucky warblers; the kitchen in context: a study of the social role of the kitchen in seventeenth and eighteenth-century American house types; Rapael Pumpelly, geologist of the Gilded Age; and the iconography of the barn in nineteenth-century American art.

In addition to the general program funded through the Office of Fellowships and Grants, competitions for fellowships are also held for specific awards. The recipient of the Harold P. Stern Memorial Fund was in residence at the Freer Gallery of Art working on the Ukiyo-e collection. At the National Air and Space Museum the third recipient of the A. Verville Fellowship will be studying the history of Turkish aviation, and the Guggenheim Fellow will be studying the history of the interactive development of aerospace technology and high energy radiation technology. A new International Fellowship was established this year and the first fellow will be in residence at the National Air and Space Museum studying the Cierva Autogiros and the development of rotary-wing flight. In 1985 the recipient of the Martin Marietta Chair in Space History was in residence studying the history of space physics from 1934 to 1985. The National Air and Space Museum also appointed the Charles A. Lindbergh Professor of Aerospace History who will be studying mechanical flight theories.

A number of senior fellowships continued to be offered at the Institution. Smithsonian Institution Regents Fellows in residence this year include Renee Boser Sarivaxivannis, curator of African Textiles at the Museum of Ethnography, Basel, Switzerland, who will spend eleven months at the National Museum of African Art working on historical aspects of African weaving.

In residence at the Smithsonian Astrophysical Observatory was Bernard Burke, William A. M. Burden Professor of Astrophysics at Massachusetts Institute of Technology. During his tenure he worked on the placement of the VLBI antenna facility in orbit around the earth. The Smithsonian Astrophysical Observatory also hosted Jeremiah Ostriker, chairman of the Department of Astrophysical Sciences and director of Princeton University Observatory, while he conducted research on high-energy astrophysics. Frank Greenaway, chairman of the Royal Institution Centre for History of Science and Technology, was in residence at the National Museum of American History researching artifacts of science and technology. Cambridge University Professor David Stoddart worked at the National Museum of Natural History on the biogeography of coral reefs and islands.

In 1984, the Smithsonian received a three-year grant from the Rockefeller Foundation Residency Program in the Humanities for postdoctoral fellowships at the National Museum of African Art and the Center for Asian Art. The grant supports research in residence at the museums in the areas of African art history and anthropology, especially material culture, and in Asian art history for research in the collections on topics that may initiate scholarly symposia, exhibitions, and other major museum activities. The recipient at the National Museum of African Art will study nomadic African women as placemakers, the arts and architectures of nomadism in Africa and the recipient at the Center for Asian Art will study the meanings of water in Mughal gardens at Agra.

During 1985 bureaus continued to offer support for visiting scientists and scholars in cooperation with the Office of Fellowships and Grants. These awards made possible visits to the Smithsonian by twenty-one persons. The office also expanded the short-term visitor program. Ninety-one persons came to the Institution to conduct research, study collections, and collaborate and confer with professional staff. OFG also instituted a workshop program to bring scholars together from a variety of fields to discuss subjects of common or complementary interest.

The expanded role of internships in the academic community continues to be reflected by support for interns within the Institution. The National Air and Space Museum funded nine interns through OFG this year. The Cooper-Hewitt Museum again appointed three students under the Sidney and Celia Siegel Fellowship fund. Internships in environmental studies at the Smithsonian Environmental Research Center also continued. The Smith College-Smithsonian Program in American Studies is now in its sixth year and ten students will participate in a seminar course and conduct research projects under the direction of staff members through this program. Placement of interns continued through bureau internship coordinators, while the OFG continues administration of all stipend awards for internships.

For the fifth year the OFG has offered academic opportunities aimed at improving minority participation in Smithsonian programs. The opportunities include fellowships for minority faculty members and faculty from minority colleges, and internships for minority undergraduates and graduate students. Awards were made to twenty-five interns who were placed at a variety of bureaus and offices on the Mall and at the Smithsonian Environmental Research Center. Some of these appointments have already developed into more permanent relationships.

The Office of Fellowships and Grants also awarded five fellowships to faculty persons to conduct research on subjects such as: Archibald John Motely, Jr., and his artistic milieu; Bontoc—Igorot of the Philippines and their presence in the United States, beginning in 1909; Black minstrelsy and its impact on Black culture in America; a study of the use of exhibits to interpret Afro-American culture during the age of disenfranchisement; the dynamics of power and gender as reflected in Hawaiian performance contexts.

In 1985 the OFG continued the administration of the Smithsonian's cooperative education program. This student employment program encourages minority graduate students to work in professional and administrative positions at the Institution, separated by periods of study at their university, and offers the potential for permanent employment at the Smithsonian. Since January 1983 when OFG assumed the management of the Cooperative Education Program, thirty-one student co-op appointments have been made in various Smithsonian bureaus.

In 1985 the Office of Fellowships and Grants received funds to initiate two new programs:

The Native American Program for North American Indians, Inuit, Aleut, Canadian Natives, Alaskan Natives, and Native Hawaiians provides opportunities to pursue research utilizing Smithsonian collections relating to their cultures, which better enable them to interpret and maintain collections in their native museums and archives. The Native American Program is designed to support directed and independent research appointments awarded to Native North Americans. The program's goal is to promote access to Smithsonian collections and ongoing research activities related to Native North Americans by its participants. In 1985, fourteen appointments were made. The Visiting Associates Program was also begun to increase minority participation in Smithsonian research and study programs. University and college faculty/administrators, who have a commitment to expanding minority participation in higher education, will visit the Smithsonian to learn about ongoing research and research opportunities. The associates will be asked to serve as resource contacts and will disseminate Smithsonian research opportunities information to their respective academic communities. This year six appointments were made for an intensive week-long program.

The Smithsonian Foreign Currency Program awards grants to support the research interests of American institutions, including the Smithsonian, in those countries in which the United States holds blocked currencies derived largely from past sales of surplus agricultural commodities

Smithsonian Astrophysical Observatory

under Public Law 480. The program is active in countries in which the Treasury Department declares United States holdings of these currencies to be in excess of normal federal requirements, including, in 1984, Burma, Guinea, India, and Pakistan. Research projects are moving toward conclusion under program support in the former excess-currency countries of Egypt, Poland, Sri Lanka, Tunisia, and Yugoslavia.

The Smithsonian received a fiscal year 1985 appropriation of \$3,920,000 in "excess" currencies to support projects in anthropology and archaeology, systematic and environmental biology, astrophysics, and earth sciences, and museum professional fields. From its inception in fiscal year 1966 through fiscal year 1985, the SFCP has awarded about \$61 million in foreign currency grants to 247 institutions in forty-two states and the District of Columbia and Puerto Rico.

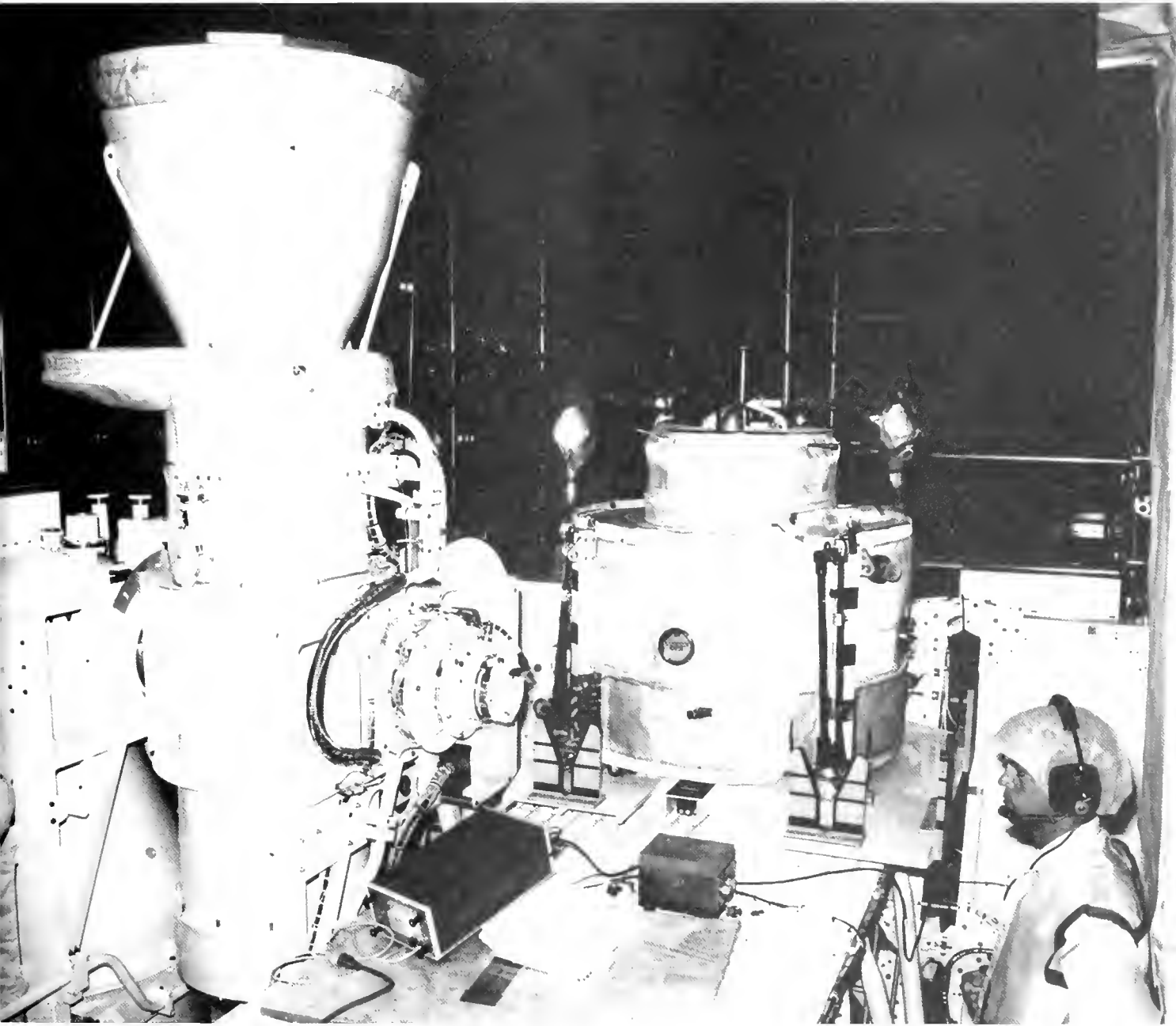
This year the projects, which ranged over many disciplines, included: studies of the ritual arts of the Baga of Guinea; archaeological investigations at Ghaz; Shah, Pakistan; research on the Muslim intelligentsia in the eighteenth-century; historical investigation of the depletion of tropical forests in India; architectural survey of Nalanda and the Lodi-Mughal transition; studies of food systems and communications structures; studies of nuclear elementary particle and relativistic physics applications in astrophysics; and comparative studies of Old World and New World tiger beetles.

In this year the Smithsonian conveyed \$980,000 equivalent in Pakistan rupees, the third installment of the U. S. contribution to the UNESCO campaign to salvage and preserve Moenjodaro, the 4,500-year-old Indus civilization city in Pakistan. The site discovered first in 1921 is being eroded by highly saline ground water and floods of the meandering Indus River. A ground water control scheme to lower the water table is in place and numerous other operations are underway.

After a somewhat shaky start that included one aborted launch and the failure of a main engine during its second lift-off attempt, Space Shuttle Flight 51 F finally achieved Earth orbit on July 29, 1985. The space vehicle Challenger carried with it a complex array of scientific experiments on an eight-day mission intended to study the stars, the Sun, and distant galaxies, as well as to test advanced technology for future missions.

Among the fourteen experiments comprising the Space-lab 2 package in the Shuttle's payload bay was a small, helium-cooled Infrared Telescope (IRT) designed and built by the Smithsonian Astrophysical Observatory (SAO) in cooperation with the University of Arizona and the NASA-Marshall Space Flight Center, with SAO's Giovanni Fazio as Principal Investigator. As soon as the IRT began taking data, it revealed numerous point sources as well as a significant portion of the Milky Way in wavelengths not seen before. But the SAO telescope also observed something more intriguing: unusually high levels of background radiation. Indeed, this mysterious infrared radiation would dominate observing sessions during the flight. The telescope, including its computer software, tracking mechanism, and cryogenic cooling system, worked almost flawlessly. However, an errant strip of plastic shielding in the telescope barrel could have produced unwanted radiation. The scientific team is continuing an analysis of the data—and the detectors—to determine if the infrared emission could be associated with the Shuttle environment.

Theorists had suggested that an optical glow reported on several previous Shuttle missions might be due to the excitation of molecules produced by the ramming action of the spacecraft traveling through the not quite vacuum of space at more than 17,000 miles per hour. A specific IRT experiment intended to study this glow did not produce the expected effects, thus suggesting that the predicted optical glow and the observed infrared background may result from two separate physical processes. Even with the high background conditions, the IRT produced new maps of both the galactic plane and the zodiacal light in wavelengths undetected by earlier experiments, including the Infrared Astronomy Satellite. In addition, tests of the properties of super-cooled liquid helium in space, essential



A small helium-cooled infrared telescope (at left center), designed and built by the Smithsonian Astrophysical Observatory in cooperation with the University of Arizona and the Marshall Space Flight Center, was one of fourteen experiments making up Spacelab 2, the most complex scientific mission ever flown aboard a Shuttle vehicle. The experiment was launched July 29, 1985, and, during an eight-day mission, produced new infrared maps of the galactic plane and the zodiacal light. (NASA photograph)

to infrared observations, provided valuable information for planning future missions.

These interesting results—and lingering questions about the high infrared background—make the IRT a possible candidate for reflight aboard another Shuttle. If so, it will join three other SAO projects already scheduled. In late 1986, an ultraviolet coronal spectrometer designed to measure temperature and velocity in the solar wind will become a free-flying satellite deployed and later retrieved by the Shuttle. The following year, ROSAT, a German-built X-ray satellite carrying a high-resolution detector designed and built by SAO, will be launched from the Shuttle. And, beginning in 1988, the Shuttle will serve as the base of operations for space science investigations using a tethered satellite. This imaginative project, which originated at SAO through the work of Mario Grossi and the late Giuseppe Colombo, will deploy a small satellite into Earth's upper atmosphere at the end of a 10- to 100-km-long wire tether linked to the orbiting Shuttle. Two SAO scientists have been selected as experimenters for the initial flight of this system, to be conducted jointly with the Italian Space Agency.

SAO scientists were also named this year as principal investigators for two major space observatories to be flown in the next decade: the Advanced X-ray Astrophysics Facility and the Space Infrared Telescope Facility. If approved by Congress and flown by NASA, the two telescopes would be operated as national facilities.

In addition to the space science activities, other research highlights included the discovery of a rare gravitational lens effect in which a relatively nearby galaxy in the constellation Pegasus is serving as a "cosmic magnifying glass" to enhance greatly the image of a much more distant quasar directly behind it. Investigators in high-energy astrophysics reported finding X-ray-emitting gas around several elliptical galaxies, which provides further evidence that the so-called missing mass of the universe may be found in the great dark halos surrounding galaxies. The data also provide a means for studying the forces of gravity in regions extending far beyond the luminous, and thus visible, matter seen in conventional optical images.

A reevaluation of the best-known map of the universe by an SAO group using advanced image-processing techniques revealed that some of the supposed distribution of galaxies in strings and filaments were due to errors in the original compilation techniques. The discovery, and the subsequent remapping now under way at the observatory, could have major implications for theories of cosmology.

And, as Comet Halley began its return to the Sun and its visibility from Earth increased, astronomers using tele-

scopes at the Whipple Observatory in Arizona obtained exciting new data.

Research carried out by SAO in cooperation with the Harvard College Observatory is both broad and diverse. Under a single director, the two observatories form the Center for Astrophysics (CFA); and, some additional highlights, organized by the divisions of the CFA, follow. For more detailed information, readers are invited to consult the SAO bibliography published in the appendices to this volume.

Atomic and Molecular Physics

Since information about astronomical objects is obtained primarily through analyses of their emitted electromagnetic radiation and of the modification of this radiation on its way to Earth, precise and comprehensive atomic and molecular data are needed to interpret and model the physical and chemical processes that characterize such objects. Division scientists seek to provide accurate determinations of these phenomena through a combination of laboratory and analytical studies. During the year, significant progress was achieved in theoretical and experimental research on photodissociation of radicals and molecules; radiative transition probabilities in ions and atoms; proton collisions with multicharged ions; electron-ion collision cross sections; and radiative, dielectronic, and dissociative recombination and radiative transition probabilities in molecules and molecular ions.

Studies relating to planetary atmospheres, comets, and the interstellar media were also carried out by division members. For example, because of the critical role ozone plays in sustaining life on Earth, it was chosen as the first test gas in the laboratory program. Results of measurements on the effect of atmospheric pressure on the millimeter-wave radiation of ozone, in combination with ground-based measurements of radiation from ozone in the stratosphere, allowed the distribution of ozone with altitude above Earth to be deduced.

Large-scale computing, fundamental to progress in theoretical studies in atomic and molecular physics, was substantially augmented during the year with the installation of an IBM 4381 computer.

High Energy Astrophysics

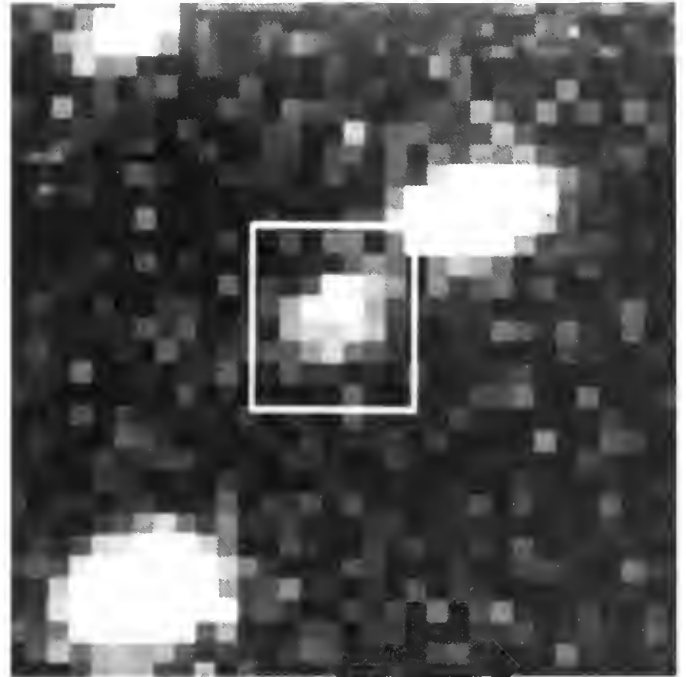
Astronomical objects that emit a substantial fraction of their energy in X-rays are the focus of research in high-

energy astrophysics. The scope of division study is broad, addressing the extraordinary processes involved in X-ray generation, the amount of matter in the universe, and the origin, development, and ultimate fate of the universe. Since cosmic X-rays are absorbed by Earth's atmosphere, these observations must be made from space via rockets, the Space Shuttle, or satellites. As some division scientists and engineers develop new instrumentation to carry out future space missions, others participate in ongoing programs of data reduction and analysis from earlier ones, such as the High Energy Astronomy Observatory satellites (HEAO 1 and 2). These latter investigations were supported both by observations at ground-based optical and radio telescopes and by operation of the Einstein Guest Investigator Program, which has brought scores of researchers from around the world to SAO in Cambridge.

Analysis of data from the HEAO-2 (Einstein Observatory) satellite revealed the existence of hot, gaseous, X-ray-emitting coronae associated with many elliptical and other early-type galaxies. Using this X-ray-emitting gas to trace the underlying distribution of matter led to the conclusion that many of these galaxies have very massive haloes composed of dark matter of an unknown nature. Other research results included the discovery of extended X-ray emission in the central region of several nearby galaxies displaying recent bursts of star formation; an analysis of X-ray-selected BL Lac objects indicating that they differ from quasars in their evolution properties; and the detection of extended X-ray haloes around several compact, galactic sources.

Observations from SAO's Fred L. Whipple Observatory at Mt. Hopkins, Arizona, helped correlate X-ray features of spiral galaxies with optical and radio properties. In addition, the great sensitivity of the Multiple Mirror Telescope (MMT) is being utilized in a search for very faint and distant quasars. These data are used to describe how the numbers of quasars and their radiated energy change over the lifetime of the universe and to improve estimates of the quasars' contribution to the all-sky X-ray background. The MMT also is being used to search for faint optical counterparts to X-ray sources found in sensitive surveys conducted with the Einstein Observatory. Distant galaxies, clusters of galaxies, and quasars are among the types of extragalactic objects being found.

Continued NASA funding supported the division's design and definition studies for two planned space-astronomy missions: the Advanced X-ray Astrophysics Facility and the Large Area Modular Array of Reflectors. Other programs focused on development and testing of X-ray-imaging detectors and grating spectrometers of sev-



Although then still some 100,000 times fainter than could be seen with the human eye, Halley's Comet was captured on February 16, 1985, by an electronic (CCD) camera on the 24-inch telescope at the Whipple Observatory. The approximately 18th magnitude comet (in the square) was moving slowly through the Constellation Orion. To enhance the comet, two 10-minute exposures were combined, causing the stars to appear slightly elongated. (Photograph by Rudolph Schild)

eral types; construction of a high-resolution imaging detector of the HEAO-2 type for the Roentgen Satellite (ROSAT); and design and development of a rocket payload incorporating a normal-incidence X-ray telescope and of a balloon payload for observing X-ray and gamma-ray sources.

Optical and Infrared Astronomy

Research in optical and infrared astronomy concentrates on extragalactic and galactic astronomy, with special emphasis on clusters of galaxies and of stars and the formation and evolution of stars. In support of these and other programs, the division operates the Fred Lawrence Whipple Observatory on Mt. Hopkins, Arizona, the site of the MMT, which is operated jointly with the University of Arizona.

Division members also collaborated on the design, construction, and flight of the Infrared Telescope (IRT). Other

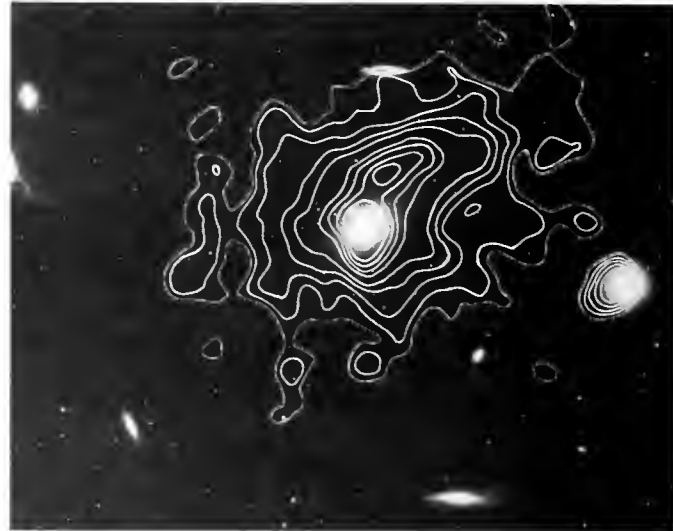
current programs involving flight instruments include planning and design of the Shuttle Infrared Telescope Facility and of a 3-meter balloon-borne telescope, as well as a possible reflight of the IRT.

Ground-based programs include a new electronic detector, developed with the University of Arizona and Goddard Space Flight Center, which will be used to make high-resolution observations in the 10-micron range from Steward Observatory in Arizona and Mauna Kea Observatory in Hawaii. And, in cooperation with University College, Dublin, the gamma-ray astronomy group at Whipple Observatory is building a system of electronic detectors for use in conjunction with the existing 10-meter optical reflector to measure the flux of high-energy particles associated with the optical bursts of Cerenkov radiation observed when high-energy gamma rays strike Earth's upper atmosphere.

In a study of fundamental importance, division scientists showed that our understanding of the large-scale structure of the universe has been flawed by errors in the classic (Shane-Wirtanen) map of how faint galaxies are distributed on the sky. Much of the theoretical work based on the older data may prove to be invalid, which has important consequences for theories of the early history of the universe. A major new survey of galaxies was initiated to address this problem, using modern CCD detectors and digital image-processing techniques. Soon, division members also will commence the "Century Survey" to map the distribution of galaxies over 100 square degrees, ultimately sampling more than four times the volume of space covered by the CFA Redshift Survey.

This systematic study of the distances to galaxies led to the discovery of a new gravitational lens in the Constellation Pegasus, which is apparently serving as a "cosmic magnifying glass" to greatly enhance the image of a much more distant quasar. (According to Einstein's General Theory of Relativity, if a massive object is positioned between an observer and a distant quasar, the light from that quasar will be deflected, or bent, by the object's gravitational field and form one or more images.) In this case, a team of scientists using both conventional instruments and the MMT identified the lens system as a 15th magnitude spiral galaxy on a line directly between Earth and a previously unidentified quasar at an apparent distance of 2300 Megaparsecs (7 billion light years).

Other investigations by division scientists led to detection of high-energy gamma rays from Cygnus X-3, a powerful X-ray source in our galaxy that may prove to be an important source of cosmic rays and provide the solution to a cosmic puzzle.



Contour lines defining the X-ray emission from an extended corona of hot gas are superposed on an optical image of the elliptical galaxy M86 (NGC 4406) in Virgo. The distortion of the lines results from the stripping of hot gas from the corona by the rapid passage of this galaxy through the center of the Virgo cluster of galaxies. A second strong X-ray-emitting galaxy, M84 (NGC 4374), is seen at right. (Optical photograph from the National Geographic-Palomar sky survey; X-ray contours from the Smithsonian Astrophysical Observatory)

Planetary Sciences

Members of this division study the planets, satellites, and small bodies of the solar system in the attempt to understand and describe the events and processes that caused their creation from gas and dust billions of years ago. Optical observations of newly discovered, faint, and unusual minor planets and comets are performed at Oak Ridge Observatory in Harvard, Massachusetts, and are closely coordinated with the International Astronomical Union's Minor Planet Center and Central Bureau for Astronomical Telegrams, which are both operated by SAO.

Some members of this group have helped organize a program of international cooperation for the observation of a series of mutual occultations and eclipses of the Galilean satellites. Observers in fifteen countries have agreed to obtain accurately timed light curves of these events in order to determine mean motions due to tidal interactions with the planet.

Another division scientist participated in an expedition to Antarctica to collect geologic samples across the contact

zone between sediments of the Cretaceous and Tertiary ages and to analyze them for meteoritic elements and other types of evidence of the gigantic impact event that allegedly extinguished the dinosaurs.

On previous expeditions, 378 new meteorites were discovered and their radioactivity is being measured to determine the length of time they have lain across the Antarctic ice. Several specimens so far measured at SAO show times varying from 7,000 to 300,000 years.

With the approach of Halley's Comet, measurements of its position will be carried out at Oak Ridge Observatory by use of a new CCD observing system for the astrometry of asteroids and faint comets. These data are essential for the proper pointing of instruments carried onboard the European-built Giotto spacecraft, which will pass close to Halley early in 1986.

A member of the planetary sciences group also carried out computer simulations of the infall of interstellar gas and dust, which suggest that chondrules—enigmatic millimeter-sized igneous globules abundant in chondritic meteorites—were produced when infalling aggregations of presolar dust were so heated by aerodynamic drag that they melted.

Other analyses included study of a unique rock type from the lunar highlands and an experimentally produced artificial analog. It was concluded that the rock originated in the lunar crust at a depth of at least ten kilometers and probably was excavated and deposited in the lunar soil by the same impact event that produced the crater Copernicus.

Radio and Geoastronomy

Division investigations focus on understanding the structure, evolution, sources of energy, and ultimate fate of radio-wave-emitting astronomical objects distributed throughout the universe. Group members are also pioneering in the use of radio astronomy techniques to measure contemporary drift among the continents; others are involved in the development of atomic clocks, tests of the theory of general relativity, and formulation of uses for long tethers in space.

Studies in very long baseline interferometry (VLBI) centered on quasars and other compact extragalactic radio sources and on molecular maser sources associated with star-forming regions of the interstellar medium. VLBI observations of these water-maser sources, which are very powerful radio-wave emitters, will help determine the size of our galaxy. By tracking the gas flows, which envelop



In November 1984, Smithsonian astronomers discovered an unusual example of the rare gravitational lens phenomenon in which a relatively nearby galaxy in the Constellation Pegasus is apparently enhancing the image of a much more distant quasar directly behind it. Here, the lens system, designated 2237+0305, has been computer-contoured at the center of the image to increase the dynamic range of brightness intensity.

newly formed stars and are made luminous by intense radio emission from trace quantities of water vapor, it is possible to determine the distance to the young objects. These experiments also contribute to understanding the motions of materials surrounding heavily obscured, massive, newborn stars, which are about fifty times more massive than the Sun.

A new generation of satellite-borne masers is under development for space VLBI and for subnanosecond worldwide timing. The present stability of these clocks is in the 10^{-16} region, that is, equivalent to the loss of one second in 100 million years. Research on operating masers at temperatures near absolute zero (1.4 K) suggests the stability could improve to the equivalent of one second loss in a billion years.

Construction also began on a long baseline optical astrometric interferometer, which is designed to make optical measurements with a precision comparable to those obtained by radio VLBI.

Using radio tracking of the Pioneer Venus Orbiter, SAO scientists are mapping small irregularities in the gravitational potential of Venus for comparison to the topography in a determination of the subsurface structure of the planet. Since Earth resembles Venus more than any other

planet, an understanding of the near-surface structure of Venus helps both to test and to develop theories describing such important terrestrial phenomena as earthquakes, volcanoes, and the formation of mineral deposits.

Solar and Stellar Physics

SAO's leadership in solar and stellar research is evidenced by the biannual workshops entitled "Cool Stars, Stellar Systems, and the Sun," which originated at the observatory and are now being scheduled at other institutions across the country. The proceedings of these workshops have become standard references for researchers in this field.

Investigations of stellar winds and mass loss, together with analogous studies of the Sun, form a major component of research. Work on stellar processes greatly benefits from further understanding of the solar wind, since only for the Sun can detailed comparisons of theory and observation be made. Other divisional endeavors include basic research on solar and stellar atmospheric modeling and on interpretation of observed spectra; computation of new models for solar active regions and for sunspots, based on data from the 1973 NASA Skylab experiment; and development of a new computer program to analyze the outflow of mass from giant stars observed to be losing mass about ten million times faster than our Sun. Ultraviolet observations carried out with the International Ultraviolet Explorer Satellite contribute to twelve different programs.

Division members also continue to develop new instrumentation and spectroscopic diagnostic techniques for determination of the physical processes responsible for producing the solar wind. SAO's ultraviolet coronal spectrometer, which has already provided the first measurements of temperature and outflow velocity in the solar-wind source region, is now being prepared for SPARTAN Mission 201, planned for deployment and retrieval by the Space Shuttle in 1986.

The division was awarded a contract to help define an ultraviolet coronal spectrometer for the European Space Agency's Solar Heliospheric Observatory. Measurement of the solar-wind source region with this instrument should provide a link between traditional observations of the solar corona and *in situ* measurements of the solar wind at far distances from the Sun. SAO hopes to provide the spectrometer through NASA's participation in the International Solar-Terrestrial Physics Program.

Theoretical Astrophysics

Research on a diverse range of astrophysical phenomena was carried out, with studies often applied to the support and interpretation of observational data. Theoretical Astrophysics Division members frequently collaborate with scientists in other divisions and at other institutions in their research as well as contribute significantly to educational programs. Two studies of more than usual interest are described here.

Of the many known types of elementary particles, only a few are ordinarily found on Earth, or even in most present-day astronomical objects. However, under the extreme conditions believed to exist in the center of quasars and active galactic nuclei, the positron—the antiparticle of the electron—may be almost as common as the electron itself. These positrons are created, in pairs with electrons, from the plentiful sources of high energy found in these objects. The resulting gas made up of electrons and positrons, called a *pair plasma*, could have remarkable properties. In fact, if pair plasmas do exist in the central regions of quasars and active galactic nuclei, their very presence might either prove—or rule out—various current theories about these central regions, including the premise that massive black holes are the ultimate energy sources. At SAO, pair plasmas have been studied as the possible origin of the high-energy radiation streaming out of quasars and active galactic nuclei. So far, the results are encouraging, for the theoretically predicted emission from pair plasmas corresponds closely to the type actually observed from these objects.

Young, hot stars are known to be rapidly losing material through high-velocity "winds" driven from their surfaces by radiation pressure. Simple theories of this phenomenon seem to be in good agreement with most observations, but not all. For example, observations by the Einstein Observatory have shown that hot stars emit X-rays, indicating an even hotter wind than predicted. One modified theory ascribes the super-hot winds to an instability in the radiation driving mechanism, which causes different parts of the wind to collide with one another and to heat up to X-ray-emitting temperatures. However, the question of instabilities has been very controversial, since some previous theoretical calculations suggested that the winds are actually stable. In a new, comprehensive analysis by SAO scientists, the conflicting results have been resolved, and the existence of strong instabilities has been firmly established. While further work will be required to verify the picture in detail, it now seems reasonable that the X-ray observations can be completely explained by wind instabilities.

Smithsonian Environmental Research Center

Basic scientific research aimed at understanding the processes occurring in the environment and their influence on biological systems and organisms is the principal activity of the Smithsonian Environmental Research Center (SERC). This research is long-term and emphasizes both laboratory and field-oriented studies in three major areas: Regulatory Biology, Environmental Biology, and Radiocarbon Dating.

SERC has two principal facilities: 50,000-square-foot laboratory at Rockville, Maryland, and 2,600 acres of land with a small laboratory and some support buildings at Edgewater, Maryland. The Edgewater property constitutes a unique estuarine research opportunity, comprising nearly one-third of the watershed surrounding the Rhode River Estuary, a subestuary of the Chesapeake Bay located a few miles south of Annapolis, Maryland. These two facilities are separated geographically by forty-five miles.

SERC also maintains an educational program that includes graduate students, postdoctoral fellows, undergraduate work/learn students, and public educational activities. The public education aspects emphasize teacher- and docent-led tours and activities. Docents guide adult and family groups on a two-mile Discovery Trail through outdoor research areas. A pamphlet keyed to signs on the Discovery Trail makes the walk self-guiding for visitors who are not on a scheduled tour. A recently developed soundtrack slide show describes the research at both Rockville and Edgewater.

Twenty-seven regular scientific seminars were held at both Edgewater and Rockville in fiscal year 1985. This is an ongoing educational activity of SERC, serving to inform the interested scientific public about SERC research activities as well as to inform SERC staff about the work of colleagues in universities and other governmental laboratories. In addition, four scientific workshops were held at Edgewater with approximately forty participants on the topics watershed research, soil science, below-ground metabolism in salt marshes, and landscape ecology.

Research is done by staff scientists who represent a diverse number of disciplines, including biology, chemistry, physics, mathematics, and engineering, in the framework of two divisions: Regulatory Biology and Environmental Biology.

Activities at Rockville

Regulatory Biology

Regulatory biology studies organisms at levels ranging from molecules to whole organisms. Research emphasis is on the mechanism and processes by which growth and development are affected by environmental factors, such as the duration, intensity, and color of sunlight; temperature; humidity; and carbon dioxide levels. Data are obtained about the biology, physics, and chemistry of the processes occurring within cells, primarily by laboratory experiments.

Plants require light from the environment to carry out photosynthesis and produce food. The photosynthetic organelles of green plants, the chloroplasts, are composed of membrane and non-membrane phases. The protein synthesis machinery of chloroplasts, chloroplast ribosomes, is distributed between both phases. The membrane-associated chloroplast ribosomes are thought to function to add proteins to the membranes, as part of the process of membrane growth. An important constituent of the chloroplast membranes is a core complex (CC I). It consists of protein, chlorophyll, carotenoids, possibly galactolipids, and ions of the metals iron and copper. It contains the reaction center for Photosystem I of the photosynthetic electron transport chain.

The biosynthesis of the polypeptides of core complex I and its structure are being studied in developing leaves of spinach, in order to understand how these polypeptides are formed and added to the photosynthetic membranes. Although CC I was originally thought to contain a single polypeptide, work this year has shown that CC I consists of three polypeptides of approximately 64,000, 56,000 and 10,000 Daltons (molecular weight). The 64,000 and 56,000 Dalton components may be the products of two closely spaced, distinct, but homologous genes which are present in chloroplast deoxyribonucleic acid (DNA).

In spinach chloroplasts the 64,000 and 56,000 Dalton CC I components appear to be synthesized in association with chloroplast membranes. Seventy-five percent of the messenger ribonucleic acid (mRNA) for these polypeptides was bound to the chloroplast membranes. This mRNA was in functional polyribosomes since the membranes synthesized these components in the absence of protein synthesis initiation. Essentially all of the newly synthesized CC I polypeptides remained associated with the membranes. These results suggest that core complex I polypeptides are synthesized on the membranes, i.e., at the subchloroplast site where they will become localized, and

that synthesis of polypeptides in association with membranes is part of the mechanism of chloroplast membrane growth.

In red algae and cyanobacteria the antennae for light harvesting phycobilisomes and their association with the photosystems of photosynthesis are being studied. Analysis of isolated photosystem II-phycobilisome particles showed that red algae have several protein components in the core complex of photosystem II. Removal of phycobiliproteins resulted in purification of a photosynthetically active photosystem II protein complex which was highly enriched in peptides with molecular weights of 50,000 and 46,000 daltons. These appear to correspond to peptides with similar characteristics in green plants and strongly suggest that photosystem II core proteins have been conserved in these two plant groups which have widely divergent structural characteristics.

From a comparison of the phycobilisome structure of two cyanobacteria it was found that two variations of chromatic adaptation operate in these species, which are otherwise very similar. In *Tolypothrix*, capable of complete chromatic adaptation, the phycobilisome size remained constant irrespective of light quality. In green light, phycoerythrin, which is capable of absorbing in this wavelength, accounted for one-third of the phycobiliprotein content. However, in red light there was a 1 for 1 substitution with phycocyanin (absorbing red light) for phycoerythrin. In contrast, in *Nostoc* which partially adapts chromatically the decrease in phycoerythrin in red light was accompanied by a decrease in phycobilisome size and appears to have a different substitution ratio of pigments. Thus even in simple prokaryotic organisms response to light quality is not identical, and not as simple as had been previously concluded.

Light absorbed by the plant pigment phytochrome can regulate many different plant processes. Efforts to learn how this molecule operates in the plant cell have focussed on a limited portion of the protein that is reversibly converted between an inactive and active form by red and far-red light.

In recent years it has been determined that exposure of phytochrome to light causes changes in the shape of the protein as well as the disposition of both charged groups and hydrophobic groups. This year it has been determined that the amino acid cysteine is located near where these changes occur and that a sulfhydryl side chain is highly reactive. In fact it is so reactive that unusual levels of reducing agents must be incorporated in purification protocols to protect the sulfhydryl side chain while isolating phytochrome from other cell components. By utilizing

reagents that bind specifically to sulfhydryl groups it has been determined that exposure of phytochrome to red light converts one or two of these groups from a relatively unreactive state to a highly reactive one, probably by becoming more exposed to the surface of the protein. If a sulfhydryl-specific reagent is added to the active form of the protein it will react with these cysteines resulting in significant changes in the properties of the protein.

If a sulfhydryl reagent is added, this chemically tagged protein appears to be normal in most of its properties except for the fact that the inactive and active forms seem to have the same conformation. The identification of this property of phytochrome is an important step toward determining the molecular nature of the light activation of phytochrome.

Salicylic acid can induce flowering in plants of the aquatic duckweed, *Lemna*. By using radiocarbon-labeled salicylic acid the uptake into *Lemna* has been studied. The dissociation constant (pKa) of salicylic acid is about 2.8 and consequently its uptake is greatly promoted by hydrogen ion concentrations (pH) values of 4.5 and lower. Nevertheless, at pH 8 significant uptake occurs and it is effective in inducing flowering. Under a nitrogen atmosphere uptake of labeled salicylic acid is not affected by pH less than 5 but is inhibited fifty percent by pH greater than 5. Uptake is not affected by potassium ionophores, nigericin, and valinomycin, but is strongly inhibited by an inhibitor of oxidative phosphorylation, CCCP (carbonyl cyanide m-chlorophenyl hydrazone). Thus, uptake of salicylic acid is an active process at pH values greater than 5 and the requirement for oxidative phosphorylation may explain the stimulating effects of phosphate on flowering found previously.

In most monocarpic plants the onset of flowering leads to rapid senescence, but in *Lemna* a flowering frond produces as many, if not slightly more, daughter fronds as does a vegetative frond. If fronds are cut in half, the distal half, which lacks any meristems, undergoes rapid senescence. The senescence of distal halves is delayed by cytokinin and speeded up by abscisic acid. Both distal halves and intact fronds senesce more rapidly as daylength is increased from 1 hour to continuous light. The role of light on senescence is not known.

Plant cells grow as a result of the internal pressure of the cell contents. External stimuli such as light can bring about dramatic increases (fifty percent) in the extension rate of fungal cells but it is not known if growth occurs because of increases in internal pressure or a change in the cell wall properties caused by light. In collaborative experiments with Dr. Ken Ortega, University of Colorado, and

Dr. Dan Cosgrove, Pennsylvania State University, the turgor pressure during constant, light-adapted growth of large single-celled sporangiophores of the fungus *Phycomyces* grown in Rockville and Denver were measured. A pressure probe was used in which a microcapillary was inserted directly into the vacuole and values of the pressure obtained while the cells were growing. Surprisingly, the turgor pressure for Rockville sporangiophores was found to be 4.0 ± 0.7 bars (20 measurements) while those grown in Denver had a value of 5.0 ± 1.4 bars (10 measurements). This difference may be due to differences in methodology for growing the cells in the two laboratories.

Environmental Biology

Since August 1984 a high precision scanning radiometer has collected data atop Mauna Loa, Hawaii. This radiometer, developed and built at the Smithsonian, gathered information on biologically harmful ultraviolet light and tracked changes in ozone also. Eight narrow bands were chosen that correspond to wavelengths measured at Rockville, Maryland.

The extremely clear atmosphere at Mauna Loa allowed measurements of ultraviolet energy in a narrow band (5 nanometers) centered around 290 nanometers. Although the energy content was small it was significant because this band degrades plastics and paints in the environment. Ozone changes were accurately tracked and solar events could be detected in these changes.

The visible spectrum divided into bands of 50 nanometers had a strong seasonal trend in Rockville. However, at Edgewater, on the Rhode River, a subestuary of the Chesapeake Bay, there was very little evidence of the same trend. The Rockville trend had higher irradiance levels in the winter months and lower irradiance levels in the summer months. This difference in energy trends at the two locations is because Rockville has higher atmospheric turbidity, probably due to poorer air quality. These trends were evident only for data compared from the same solar elevation. However, the ultraviolet region which is modulated by ozone, did not clearly show this trend. Ozone increased from a winter minimum to a late spring or early summer maximum. Thus more ultraviolet, at a given solar elevation, reached the surface in the winter months. Therefore, with a decrease in ozone and atmospheric turbidity in winter, far more energy should be received in the winter than in the summer.

If far-red radiation is added to a background of white light the stomatal aperture in the primary leaves of beans

(*Phaseolus vulgaris*) increased and the rate of photosynthesis also increased. This increased photosynthesis appeared to be directly responsible for the stomatal response. Experiments simulating natural canopy shade indicated that accounting only for radiation in the visible wavebands (400–700 nm) can lead to major errors in estimating photosynthetic rate. Naturally occurring levels of far-red radiation in canopy shade can enhance the photosynthetic rate by a significant amount.

Large diurnal variations in the absolute carbon dioxide concentration correlated highly with rainfall and carbon uptake, photosynthesis, in the tropical forest on Barro Colorado Island, Republic of Panama. Diurnal variations were greatest during the wet season by a factor of two compared with those during the dry season, i.e., 90 ppm versus 45 ppm. The wet season carbon uptake was roughly 30 percent higher than the dry season uptake. The average absolute carbon dioxide concentration over the first two years of station operation was 356.1 ppm with an average annual increase of 3.5 ppm. The diurnal variation during the wet season, 90 ppm or 25 percent of the absolute concentration, indicated the great impact of the carbon uptake of the tropical forest on the ambient carbon dioxide concentration.

A major difficulty in determining the relationship between photosynthesis and leaf water stress has been the determination of the two processes in the same tissue. While photosynthesis can be measured non-destructively and monitored through dynamic changes in environmental parameters such as temperature, humidity, and sunlight, the measurement of the leaf water status has been done by removing a leaf, and includes destruction of tissue. During the past year a system was developed in which both gas exchange including carbon dioxide, water, and leaf water potential were simultaneously measured. Leaf water potential was changed by reducing the root temperature to interfere with the uptake of water. This caused a reduction in leaf water potential and photosynthesis.

When plants grown at low salinity were subjected to increasing salinity, the light saturated rates of photosynthesis, carboxylation efficiency, light harvesting efficiency, and stomatal conductance all declined. At low salinity, stomatal conductance accounted for less than 10 percent of the inhibition of photosynthesis but this increased to over 50 percent in plants grown in salt concentrations 1.5 times that of sea water.

When plants were slowly adapted to high salinity, acclimation could be seen as an increase in the light and CO₂ saturated rates of photosynthesis and the carboxylation efficiency as well as a decrease in stomatal inhibition of

photosynthesis. These acclimations improved the capacity of plants to fix carbon dioxide at higher salinity compared with plants grown at low salinity but the cost was a decrease in water use efficiency (the ratio of carbon dioxide assimilated to water lost).

Radiocarbon Dating

Dating of salt-marsh sediments from coastal Maine continues in order to provide a detailed chronology of crustal down-warping. Results thus far from southwestern, central, and northeastern regions indicate a land subsidence rate ranging from 30 centimeters per century in the west to nearly a meter in the northeast near Passamaquaddy Bay.

Prior investigations of glacial retreat in northwestern New Jersey and northeastern Pennsylvania have suggested an age of about 12,000 years for this event. Samples cored from sediments of small lakes in New Jersey have consistent ages of 18,500 to 18,000 years for ice retreat. These dates require major rethinking of glacial history in the Northeast.

Activities at Edgewater

Streamside Vegetational Buffers

Historically in the coastal plain of Maryland, while uplands have been cultivated, deciduous hardwood forests have been maintained on most lowlying areas adjacent to streams. This was the direct result of the fact that these areas were too wet to cultivate in the spring. Current research at the Edgewater site is illustrating how fortuitous this situation has been for the ecology of Chesapeake Bay where excessive nutrient enrichment is a serious problem. Nutrient concentration changes were measured in surface runoff and shallow groundwater as they moved from croplands through these riparian forests. Dramatic decreases were observed, especially for nitrate, which is very important to the ecology of Chesapeake Bay. High concentrations of nitrate are released from croplands. This nitrate does not bind to soils, is readily utilized by plants, and is the nutrient most likely to cause detrimental effects in the Bay. From surface runoff waters that had transited 50 m of riparian forest, an estimated 4.1 tonnes of particulates, 11 kg of particulate organic-N, 0.83 kg of ammonium-N, 2.7 kg of nitrate-N and 3.0 kg of total particulate-P per ha of riparian forest were removed during the study year. In addition, an estimated removal of 45 kg per ha of nitrate-N

occurred in subsurface flow as it moved through the riparian zone.

Morning Glory Ecology

Ipomoea hederacea, a common weed in cultivated fields of eastern North America, disappears quickly following abandonment of fields. Manipulative experiments were conducted during the first year after abandonment to determine whether this disappearance was due to the inability of these plants to compete with other weeds for nitrogen. Various experimental plots were either kept free of other competing plants, subjected to nitrogen fertilization, or given both treatments. Results suggest that this species is eliminated in old fields because it is a poor competitor for nitrogen and that the main result of competition is reduction in below-ground biomass and reduced seed production.

Separate Feeding Habitats for Male and Female Hooded Warblers

Wilsonia citrina is a common woodland bird which nests in eastern North America. Males and females were found to defend exclusive feeding territories in the Yucatan Peninsula of Mexico. While the species was found to utilize woody vegetation ranging from successional scrub to tall evergreen forest, males were most abundant in closed-canopy forest of moderate to tall stature, while females were commonest in lower, more open vegetation. The pattern of plumage variation in females suggests that those with male-like melanistic plumage tend to locate their territories in the kind of habitat occupied by males.

Nutrient Dynamics of Brackish Marshes

Tidal marshes on Chesapeake Bay have been shown to remove particulate matter and associated nutrients from flooding waters and to release dissolved nutrient fractions to ebbing waters. A recent study addressed the mechanism of nutrient processing in these marshes by measuring chemical gradients in marsh soil waters along transects from creek banks into the interior of the marshes. Rates of hydrologic movement of these soil waters into the creeks as seepage from the banks during low tide were also measured. Estimates of dissolved nutrient release rates due to this bank seepage were found to be only 5 to 15 percent of

marsh dissolved nutrient release rates measured by other methods. These results indicate that mechanisms for the release of dissolved nutrients directly from the marsh surface are more important than previously considered.

Microbial Activity in the Estuary

Bacteria and phytoplankton populations and metabolic activity were measured along the channel of the Rhode River. Phytoplankton comprised 80 percent of the total microbial biomass and bacterial numbers ranged from less than one million to 54 million per ml. Bacteria cell production rates averaged about 1 million per hour per ml. These data were compared with water quality data from the same locations and positive correlations were found between all measures of microbial activity and most nutrient fractions in the water column.

Semilunar Reproductive Cycles in Killifish

Fundulus heteroclitus, an abundant minnow in shoreline habitats of Chesapeake Bay, moves in and out of brackish tidal marshes with the tides to feed on the marsh surface. Lunar spawning rhythms are common in species of shallow-water coastal fish and semilunar reproductive cycles have been reported in a few cases. In the Chesapeake, however, weather factors affect water levels as much as the sun and moon, resulting in low correlations between tidal amplitude and predictions which are based upon astronomical cycles. A study was therefore conducted of the rhythmicity of reproductive activity of this species to determine if semilunar cycles occur in the absence of well-defined lunar tidal cycles. Both female and male *Fundulus heteroclitus* were found to have distinct semilunar cycles in their readiness to spawn, from May through August, and these cycles were usually in phase with the lunar cycle.

The original aim of the Smithsonian Office of Educational Research (SOER), to pioneer research into the process by which people learn outside the formal learning environment, was achieved in 1985. Consistent with the Institution's policy that once experimental programs have achieved success they are best administered through established offices, SOER was abolished September 30, 1985, and its employees were assigned to other educational and research support activities. In carrying out its objectives before termination SOER initiated studies to examine how people learn in a wide variety of social and physical contexts, particularly the role of the family in learning.

The Smithsonian Family Learning Project (SFLP) developed science activities for families to do together at home. This program received enthusiastic response from tens of thousands of families and unsolicited national publicity. SFLP activities were available in the form of a poster-sized wall calendar in 1985 and calendars for 1986 and 1987 will be completed.

A three-year National Science Foundation (NSF) funded study "The Role of the Family in the Promotion of Science Literacy" was completed. This project encompassed six studies which examined attitudes and behavior of family members, with particular attention to educational interactions. Results of the study indicate that families are responsible for a great deal of the education of its members. Therefore the family can provide an excellent foundation on which to build new approaches to science literacy in children and adults.

Also completed was a one-year NSF-funded feasibility study of a project entitled "The Community Science Project." This project was an effort to deal with growing national concerns about the quality of science education, exploring alternatives to a solely school-based model of education. Results suggest that science education can be improved by utilizing resources of the entire community.

Results of SOER studies concerning the dynamics of behavior and learning through museum visitation and families will continue to be useful to professionals in education, exhibit design, and family services nationwide. Findings were disseminated through publications, seminars, and workshops for both professional and lay audiences.

Smithsonian Tropical Research Institute

Prior to 1960 tropical biology was a relatively obscure sub-discipline in the field of biology. Beginning in the 1960s and continuing at an ever increasing pace, insights derived from experience in the tropics have revolutionized the biological sciences. Our understanding of the roles of competition, predation, coadaptation, behavior, genetics, sexual selection, and the impact of environmental stability and perturbations on the evolution, ecology, and diversity of tropical organisms has been instrumental in redefining empirical and theoretical understanding in biology. The Smithsonian Tropical Research Institute (STRI) has played a decisive role in that development as a result of the research of our twenty-six permanent staff and the visits each year of about seventy students and more than four hundred other scientists.

STRI performs four major functions as the nation's leading international center for the advancement of basic research in tropical biology. Its professional staff carries out fundamental research on the ecology, evolution, and behavior of tropical plants and animals, including mankind; it provides major facilities for the international scientific community to study both terrestrial and marine tropical biology; it is a center deeply committed to environmental education and to conservation of tropical ecosystems; and it has the responsibility to protect and manage the Barro Colorado Nature Monument, under the terms of the Western Hemisphere Convention of 1940 on Nature Protection and Wildlife Preservation.

STRI's success in attaining these goals is underscored by two recent events that will benefit the Institution for many years into the future: the Government of Panama extending to STRI the prerogatives and benefits that correspond to status as an International Mission operating in Panama, and receipt of a \$4 million grant from the Earl Silas Tupper Foundation. This grant will allow construction of a new research center at the site of our administrative headquarters and modern library. Consolidation of our terrestrial research programs will be aided, as will our ability to host conferences and symposia. The STRI Master Plan initiated this past year envisions other timely construction projects to improve STRI's ability to serve as a modern center for tropical biology now and in the future.

A Pioneering Tree Census

The biotic diversity of tropical forests is legendary, yet few comprehensive studies of tropical tree diversity and population dynamics have been undertaken. One such study on Barro Colorado Island (BCI), directed by Drs. Stephen

Hubbell and Robin Foster, seeks to gain an understanding of the structure and dynamics of a 50-hectare tract that has remained intact since the time of the Spanish explorers.

The 240,000 plants censused five years ago were again censused during 1985 with the help of fifty volunteers from Earthwatch. In addition to remeasuring tagged plants, all new saplings were mapped, measured, and identified. Hubbell and Foster have found, for example, that the canopy changes often and the life span of most trees appears to be shorter than previously thought. The tree census project is clearly the most extensive and definitive assault to date on the mystery of tropical tree species diversity, assuring that the results will stand for many years.

Paleoecological research in the Hubbell-Foster plot on BCI has provided radiocarbon determinations for the age of the old forest and phytolith evidence for the nature of its prehistoric modification. Carbon-14 dates from archaeological excavations indicate that the forest is at least 400 to 500 years old. Phytolith studies indicate that it was not under a slash and burn agricultural regime, but it was partially cleared by prehistoric populations in areas that coincided with the location of their settlements.

Bats and Figs

Ten years ago, Dr. Charles Handley, of the National Museum of Natural History, initiated a study of bat populations through one generation. That study was completed in 1985 after 858 nights of mist-netting and 48,375 captures of bats. A total of 56 species of bats were recorded from BCI during the study. *Artibeus jamaicensis* made up about two-thirds of the catch and was, thus, the focal species for the study. Handley has shown that the foraging range of *Artibeus* is somewhat larger than the 3,600 acres of BCI, adult female annual survival rates are about 60 percent, and potential longevity is as much as 10 years.

Artibeus feed primarily on figs, so more than 600 fig trees covering over approximately one-third of the island were mapped. Handley found that by keeping track of fruit conditions on numerous fig trees he could follow the activities of bats with considerable precision. Knowledge of the bat-fig relationship has stimulated numerous questions about fig systematics, ecology, and evolution.

Iguana Biology and Management

Studies of the green iguana (*Iguana iguana*) moved forward on several fronts. Dr. Brian Bock has shown that



Legislators from the National Assembly of Panama are shown during a visit to the Barro Colorado Island forest preserve in March 1985. From left to right are Secretary General Erasmo Pinilla, Hon. Raul Montenegro, Mr. Alfredo Ocana, Hon. Tomas Guerra, and Hon. Vianor Serracin. (Photograph by R. Brosnahan)

iguanas around Gatun Lake face a severe problem in scarcity of nest sites. Female iguanas from this population gather annually at the available sites to nest in aggregations, and the hatchling iguanas emerge several months later to rapidly disperse away from these sites.

An intensive mark-recapture effort of female iguanas over five nesting seasons produced evidence of strong nesting site fidelity. However, some females also explored and occasionally nested singly in new sites that became available to them during this study. Thus, the site fidelity demonstrated was not absolute, although most female iguanas returned to the same nesting site year after year.

Electrophoretic analysis of blood and tissue samples obtained from female iguanas captured at several nesting

sites revealed significant allele frequency differences among these iguanas at one of the two polymorphic loci inspected. Apparently, female iguanas associated with the most isolated nesting aggregation may belong to a distinct local population, somewhat reproductively isolated from the populations at two other nesting sites. The nesting site fidelity exhibited by female iguanas and the movement patterns documented for both female iguanas and dispersing hatchlings corroborate this electrophoretic evidence. Limited dispersal and nesting site fidelity may restrict gene flow between local demes.

Scarcity of nest sites, high juvenile mortality, and rapid destruction of forest, the primary habitat of iguanas, threaten iguana survival and an important traditional

source of protein for people throughout much of Latin America. Through the Iguana Management Project, Dr. Dagmar Werner and associates constructed three large cages in which adult females laid eggs in artificial nests. Eggs were then incubated in seminatural incubators. The 1,500 hatchlings derived from the eggs of over 50 females led to discovery that the incubation period not only depends on temperature, but also on substrate humidity and egg arrangement. Furthermore, incubation conditions as well as genetic factors influence hatchling weight and body proportions, providing a basis for iguana management as a food source. Support for this project is derived from the W. Alton Jones Foundation and the James Smithson Society.

Impact of African Honeybee

Several years ago Dr. David Roubik initiated studies of bees in an effort to track the arrival of African honey bees in Panama as well as to assess their impact on native bees and plants. An outgrowth of that work has been development of protocols to adjust the African bee when it comes into conflict with human society throughout Central America. Other results of this work and collaborative efforts with Drs. Henk Wolda and James Ackerman include demonstration that tropical bee population dynamics were remarkably consistent in both wet and dry years. A six-year study by Roubik at three forest sites shows that several euglossine bees studied have, by far, the most stable known insect populations on earth. This population stability in native bee populations should make it possible to detect even subtle impacts of African honeybees on the native fauna. An experimental study completed in Soberania National Park provided evidence that at the low colony density expected for African bees in Neotropical forests, ten years may be required to alter bee populations. Renewed interest in African honeybees has been sparked in North America with discovery of a feral colony in California, transported there by a ship.

Insect Diversity

The vast diversity of tropical insects is at the center of numerous STRI research programs. For most groups many species have not yet been collected, identified, and named. Even for the best-known groups, such as butterflies, detailed life history studies that connect the various life stages (larva, pupa, adult) have not been completed. Dr.

Annette Aiello continues her studies of immature insects and their behavior. Her efforts have greatly expanded knowledge on the larva, pupa, and host plants for many insects.

Animal Behavior

Animal behavior is the focus of many research projects at STRI and three books on animal behavior were published by scientists associated with STRI during 1985. In *Communication and Noncommunication by Cephalopods*, Dr. Martin Moynihan summarizes current knowledge of the communication and related systems of octopuses, squids, and their allies, and assesses the comparative and theoretical implication of available data. In *The Tungara Frog: A Study in Sexual Selection and Communication*, Dr. Michael Ryan, a former STRI predoctoral fellow, demonstrates the interplay of sexual and natural selection. *Social Evolution* by Robert Trivers, a Regent Fellow at STRI in 1981, provides "a stimulating tour of the most important controversies" in the field of sociobiology.

Plant Physiology

Increased understanding of the environmental variability experienced by plants and animals has stimulated several studies of the means used by plants to deal with drought stress. Measurements of leaf loss and leaf water potentials for ten species of shrubs and saplings of canopy trees show interspecific variation in phenology and water relations. Only species with deep tap roots (*Hirtella triandra* and *Prioria copaifera*) are able to produce and expand new leaves during the dry season. Shallow-rooted species develop lower water potentials, indicating greater water stress. In *Hybanthus prunifolius* this appears to be partly alleviated by leaf abscission during the dry season. *Psychotria horizontalis*, in contrast, postpones leaf drop until the onset of the rains when its green, fallen leaves root in damp litter. Thus, new plants are produced following leaf abscission that favors vegetative propagation.

Egbert Leigh has recently analyzed data on tree distributions over small islands in Gatun Lake which have been continuously forested since the islands were isolated from the nearby mainland early this century. Tree diversity on these islands has declined rapidly, but tree species composition on those islands is remarkably similar. It appears that relatively few species are particularly suited, perhaps physiologically, to conditions on these islands.

Perturbation in Marine Ecosystems

Just as we discovered unpredictable fluctuations in tropical terrestrial ecosystems, so marine ecosystems also demonstrate a wide range of aperiodic disturbances. Two examples under study by STRI staff are excellent examples of the importance of long-term research in tropical biology. Nancy Knowlton is examining the recovery of the reefs of Jamaica following extensive damage caused by Hurricane Allen in 1980. A recensus of individually marked colonies indicated that the once-dominant coral *Acropora cervicornis* continues to decline, largely due to predators which are now more abundant than before the storm. Apparently, community composition of these reefs may be permanently altered by a single disturbance event. Drs. Peter Glynn and Robert Richmond documented an apparent local extinction of *Pocillopora damicornis* in the Galapagos due to a particularly strong upwelling of cold water this year. *P. damicornis* had been the most abundant coral species in this area, and it will be important to exploit the opportunity to follow the reestablishment or change in this well-isolated population.

Harilaos Lessios has continued his studies of the evolutionary and ecological consequences of the mass mortality that devastated populations of the sea urchin, *Diadema antillarum*, throughout the Caribbean. He has found that survival of juvenile sea urchins is very low, and that populations remain at low levels. The absence of *Diadema* does not appear to have affected other species of sea urchins (potential competitors), but it has had an effect on the survivorship of juvenile coral colonies. Where *Diadema* is absent but other sea urchins are present, small coral colonies flourish. Where *Diadema* was added experimentally, survivorship of colonies decreased, possibly because of the grazing action of this species. More interesting, in reefs where all the species of sea urchins have been removed, the juvenile corals are doing extremely poorly, because they are outcompeted by algae, which are normally kept at lower levels by the sea urchins. Lessios has also found that despite the severe reduction in population size, genetic variability of *Diadema* has stayed at its premortality levels, suggesting that the potential exists for a recovery of the species. However, if the populations stay low for many years, it is possible that their genetic structure will be affected.

Biology of Marine Crustacea

About thirty-five species of fiddler crabs (*Uca*) in Tropical

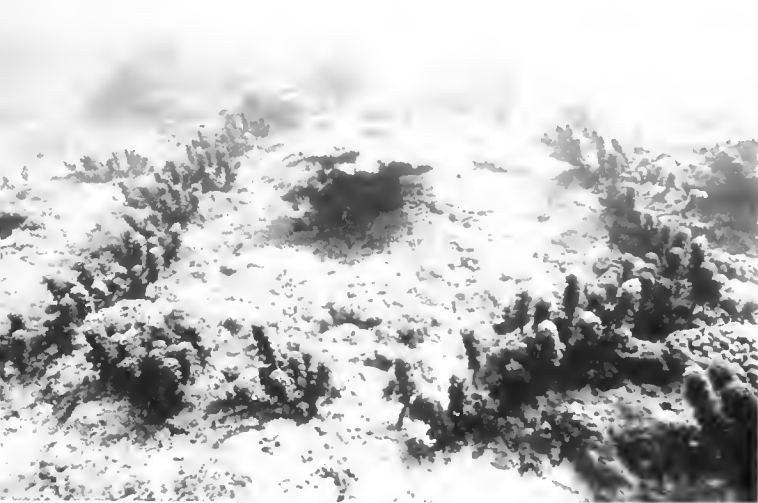
America court from and defend burrows to which females come for mating and breeding. Males court by waving their single enlarged claw in a species-specific pattern and tempo. Males of three small species often construct arching pillars at burrow entrances, and these were thought to afford aggregated males more time to court without aggressive interference from neighbors. Field research by Dr. John Christy on the competitive and courtship behavior of male *Uca beebei*, a pillar building species, indicates this explanation is not correct. Instead, pillars appear to be visual markers that guide receptive females to a burrow entrance after a courting male has disappeared from the surface during the final stages of the courtship sequence. Pillars probably are icons of the visual image presented to females when a male raises its large claw revealing its dark ventral surface just before entering his burrow.

Population Biology of Clonal Animals

Clonal organisms are plants and animals that propagate primarily by asexual reproduction. The principal organisms that build coral reefs are clonal, including algae and corals. Dr. Jeremy Jackson and his colleagues are studying the population dynamics of clonal animals (corals and bryozoans) and the factors that affect their distributions using sequences of photographs taken every few days on the same reefs. They have shown that competition for space is as important as predation in structuring reef communities, and that very low levels of larval recruitment decrease the ability of clonal animals to respond quickly to environmental changes such as the recent mass mortality of *Diadema*. Another important finding is that the sexually produced larvae of most clonal animals do not disperse far from their parents. This result violates most theoretical models for the evolution of sex as an individual adaptation which presume widespread dispersal of the sexual stage.

Paleohistory in Panama

Richard Cooke, Dolores Piperno, and Paul Colinvaux recently cored three highland lakes in Veraguas Province to obtain fossil pollens and phytoliths for paleoecological reconstruction. A date of 10,070 years before present was obtained for one (La Yeguada), making it one of the oldest yet known in the humid tropics. Pollen and phytolith studies of these deposits should provide a long and detailed history of human land usage, vegetation, and climate.



Hedgerows of macroalgae mark the territorial boundaries of surgeon fish *Acanthurus lineatus* in Morea, French Polynesia.

Educational Programs

To consolidate our programs, the Office of Educational Coordinator and the Office of Conservation and Environmental Education are being merged into a new Office of Educational Programs (OEP). Mrs. Georgina de Alba will be head of this office and Mr. Jorge Ventocilla will serve as environmental specialist. The primary goals of this reorganized office will be: (1) to administer all STRI fellowship and assistantship programs; (2) to communicate information produced from STRI-sponsored research to nonscientific audiences; and (3) to increase appreciation of tropical fauna, flora, and cultures and promote their conservation.

Several STRI books for the lay public were published. One of these was *Guía de los Árboles Comunes del Parque Nacional Soberanía* by George Angehr, Phyllis Coley, and Andrea Worthington, a guide to the most common trees of Soberanía National Park, an area with the most accessible lowland forest in northern Latin America. The manuscript was prepared by the authors while they were graduate students doing research on Barro Colorado Island.

Another book of general interest published with STRI support and including papers by several STRI authors was *Agonía de la Naturaleza*, edited by Stanley Heckadon, a STRI research associate and Jaime Espinosa, from the Instituto de Investigación Agropecuaria de Panamá. The book is in Spanish and includes a series of essays pertaining to the natural environment and the hidden costs of eco-

nomie development without environmental considerations.

Outreach

The Isthmus of Panama with access to two oceans provides excellent opportunities for the study of marine ecology. From February 25 through April 5, STRI and the University of Panama's Center for Marine Sciences and Limnology gave the first intensive graduate field course in Marine Ecology offered at the University of Panama. Nine Panamanian students participated, and a grant from the Tinker Foundation made possible the participation of five invited students from Venezuela, Ecuador, Costa Rica, Colombia, and Mexico. The course included lecture and laboratory sessions led by scientists from both sponsoring institutions, and field trips to sites on both the Atlantic and Pacific coasts of the Isthmus.

From August 4 to August 10, STRI and Panama's Ministry of Education organized a seminar to introduce issues of environmental education and conservation of tropical ecosystems to Panamanian high school students. Thirty-three high school students and eight professors attended lectures and took part in projects at one terrestrial and one marine site. Supported from the Smithsonian Educational Outreach Program, this course was a first in Panama and will hopefully serve as a model for future seminars.

To educate the general public about the value of forests and the effects of deforestation, STRI's Office of Conservation and RENARE produced a poster entitled "We are losing our forests . . . we are losing more than just trees." Financed by the Smithsonian's Women's Committee, the poster has been widely distributed throughout Panama and other countries in the region.

As part of STRI's outreach program directed to the community of the host country, a fifth SITES exhibition in Panama entitled *Marine Mammals of the World* was presented at the Museum of the National Bank jointly with the Department of Marine Resources of the Government of Panama. All exhibition materials were translated into Spanish.

Fellowship and assistantship programs at various academic levels funded by the Smithsonian, the Exxon Corporation, and private donors supported more than sixty young men and women at STRI conducting individual research or participating in ongoing research projects at various STRI facilities. A grant from the Jessie Smith Noyes Foundation made this year will fund a new fellowship program for Latin American doctoral candidates.

Other Activities

STRI is participating together with the International Foundation, World Wildlife Fund, CATIE, and the Association of Kuna Employees in the second year of a wildlands management project of the western sector of the Kuna Indian reservation. Jorge Ventocilla, from the Office of Educational Programs, is technical coordinator for this project which includes natural resource management, scientific investigation, and environmental education.

Two uninhabited and virtually undisturbed Pacific islands (Gamez and Bolaños) which lie ten miles off the Pacific Coast of Panama, have been donated to STRI through the Nature Conservancy's International Program. A gift of Mrs. Jean Niemeier of Poulsbo, Washington, in honor of her late husband Edward A. "Ed" Niemeier, these islands are forested and the larger one contains archaeological sites with pottery remnants dating AD 1200 to 1300.

Staff Changes and Appointments

Peter Glynn resigned after eighteen years of very productive research in the field of coral reef biology to join the University of Miami's marine laboratory. Robert Dressler left Panama in June of this year to accept a part-time position at the University of Gainesville in Florida. Dressler will continue to work in Panama and other tropical areas to advance his studies of orchid biology.

Mr. Pedro Acosta retired as chief of the Game Warden force at Barro Colorado Nature Monument. Warden Alejandro Hernandez was appointed as his replacement. Other staff changes included the departure of Drs. Gene Montgomery and Frank Morris to pursue other interests and the retirement of Patrocínio Esturain after nineteen years of service as a cook on BCI.

With respect to SI's branch library at STRI, Sylvia Churgin joined us in Panama as branch librarian and Roberto Sarmiento accepted the position as reference librarian. Among their first tasks was the development of improved communication. On-line data base searching through DIALOG was initiated as the only library in Panama to have such capabilities. An 800-Panafax is the latest instrument for transmitting facsimile copies to improve communication with Washington, D.C.

Photographer Richard Brosnahan was assigned to duty at STRI during the past year by the Office of Printing and Photographic Services.

Finally, the Smithsonian Office of Design and Construction has employed Fernando Pascal, an engineer, to be stationed at STRI.

Distinguished Visitors

Recently appointed Secretary Robert McC. Adams visited STRI in January of this year with the purpose of obtaining firsthand information about this "off the Mall" bureau.

STRI hosted three congressional delegations from the United States this year: Congresswoman Barbara Mikulski and Congressman Norman Shumway visited BCI as did a group of staff representing the Committees on Public Works and Transportation, Public Buildings and Grounds, and House Administration; Congressman James Weaver visited STRI during a survey of issues related to tropical forestry; and Mike Lowry (chairman) and staff of the Subcommittee on Panama Canal and Outer Continental Shelf were briefed on STRI programs in Panama during a visit to BCI.

In March, Honorable Legislator Raul Montenegro and other legislators from the Panamanian National Assembly were briefed on programs and plans by STRI director and staff while spending a full day visiting BCI, the Pipeline Road area in the "Parque Nacional Soberania" and the Iguana Management Project site. The "Alternatives to Destruction" projects were discussed.

Dr. William Durham, a professor at Stanford University and a MacArthur Fellow, spent eight months in Panama initiating a long-term study of demography of the Kuna Indians of the San Blas Islands. Other distinguished visitors included members of the Board of Trustees of the W. Alton Jones Foundation and Mrs. Jean Neimeier.

HISTORY AND ART

Dean W. Anderson, Acting Assistant Secretary for History
and Art .

Anacostia Neighborhood Museum

The Anacostia Neighborhood Museum (ANM) opened its doors in Washington's far southeast Anacostia community on September 15, 1967. In its eighteenth year of operation, Anacostia—the Smithsonian Institution's first satellite museum—serves as a national resource for exhibition, scholarly and applied research, historical documentation, and interpretive and educational programs relating to Afro-Americana. A national prototype that also serves as a resource center for similar institutions around the nation, ANM has pioneered new and creative ways of involving nontraditional museum goers with the exciting worlds of science, history, and the arts. The museum also serves as a cultural stimulus for the people of Anacostia.

Offering a view of history that takes into account the many positive contributions of Black Americans, the Anacostia Neighborhood Museum serves as a catalyst and works cooperatively with other Smithsonian bureaus to strengthen their own capabilities in identifying and documenting those artifacts in their collections that relate to Black history and culture. As a member of the African American Museums Association (AAMA) and the American Association of Museums (AAM), the museum aggressively works with other museums, research institutions, and archival repositories throughout the United States and abroad to enhance the awareness and appreciation of ethnohistory, ecomuseums, and century-old contributions of Blacks to western civilization.

Research began this year for the fiscal year 1987 exhibition *Climbing Jacob's Ladder: The Development of the Black Church, 1787–1900*. Extensive contacts and visits with individual congregations and major repositories of church records from the Southern Georgia-Carolina Sea Islands to Boston, Massachusetts, have been made and the project, which was widely reported in *Smithsonian Institution Research Report* (No. 44, Winter 1985), already has attracted enthusiastic interest among academicians and museum scholars. This year the museum also successfully negotiated with Tuskegee Institute (Alabama) to borrow the visual records of photojournalist Prentice H. Polk (1898–1985). An exhibition based on this material, *P. H. Polk: The Man and His Works*, will highlight the extraordinary talent and sensitivity of Polk as well as the strength and quiet dignity of his subject: southern folk and folkways.

Necessary replacement of the roof and expansion of the museum's Exhibits Laboratory began in 1985. The new addition, which will house the education department and provide safe, dry, and environmentally controlled exhibition areas and public space, was begun in May and, for the first time, all Anacostia staff will be under one roof. In



Pictured at the ground-breaking ceremony on May 21, 1985, for the Anacostia Neighborhood Museum's new Fort Stanton facility are (left to right) Robert Stanton of the Park Service; John Blake, Anne King, and Addie Cook of the Anacostia Community; John R. Kinard, director of the museum; and Smithsonian Secretary Robert McCormick Adams.

addition, ample on-site parking and the pleasant surroundings of a post-Civil War fort at this Fort Stanton Park site will enable the museum's education department to expand its offerings and provide a broader range of interpretive programs for diverse groups of museum goers while attracting still new audiences.

Archives of American Art

As a research bureau, the Archives of American Art takes particular pride in its acquisitions program. Fiscal year 1985 was especially productive in collections of papers whose value for scholarly enquiry is immediately apparent and whose subject matter is more than usually varied.

The records of the Betty Parsons Gallery, of the critics Clement Greenberg and Thomas Hess, and of the artists Lee Krasner and John Graham provide rich information on the rise of abstract expressionism to a position of dominance in American art. Several hundred prints donated by the movement's unofficial photographer Hans Namuth offers a useful visual supplement to this material. Postwar modernism in architecture is represented in substantial groups of Marcel Breuer and Charles Moore papers.

Perhaps the most remarkable of the year's new collections records the history of the Institute of Contemporary Arts, a Washington, D.C., organization devoted to bringing the best in international culture to the nation's capital. Beginning in the late 1940s and extending well into the 1960s, it sponsored more than a thousand exhibitions, concerts, recitals, demonstrations, readings, and lectures. Its founder and director Robert Richman conducted correspondence with a vast array of celebrated men and women in the arts, including W. H. Auden, Alexander Calder, John Cheever, E. E. Cummings, T. S. Eliot, Walter Gropius, André Malraux, Henry Moore, Dorothy Parker, Wallace Stevens, Dylan Thomas, William Carlos Williams, and Frank Lloyd Wright. Many of these letters have revealing passages—Auden speaks of Eliot, Eliot speaks of Ezra Pound, and Thomas speaks of borrowing money, but the chief value of the collection lies in its documentation of an ambitious experiment in an integrated approach to the arts.

The Archives continued its special collecting projects in Philadelphia and Rhode Island, where preliminary surveys of art-related records in institutional and private hands were completed and selective microfilming was begun. A similar survey of papers in the South is now under way and another covering the Chicago area opened in September. The Texas State Project finished its work in fiscal year 1985 after six years of intensive collecting and filming in the Southwest. All of these activities are supported by corporate or foundation grants.

Research pursued among the Archives' resources demonstrated the continued vigor of scholarship in American art throughout the country. The Archives' offices received 3,200 research visits from graduate students, curators, art and cultural historians, and independent scholars. Research conducted outside the Archives' centers in Boston, New York, Detroit, San Francisco, Los Angeles, and



Sidney R. Yates, representative from Illinois, and Mrs. Yates are shown with Muriel Kallis Newman, Archives of American Art Trustee, and her husband, Albert, at the Archives' thirtieth anniversary reception.

Washington, D. C., brought requests for 1,790 rolls of microfilm. This year more than two hundred books, exhibition catalogues, and articles based on Archives resources were published.

Again, the Archives pays tribute to its Trustees and members and to foundations across the country whose generous contributions support the Archives' collecting programs, scholarly journal, and research of the collections. In particular, appreciation goes to A. Alfred Taubman and Mrs. Ahmet M. Ertegun who, with considerable persistence and hard work, brought more than \$60,000 to the Archives. Others whose efforts raised more than \$200,000 include Mrs. Francis de Marneffe, Mrs. Dwight M. Kendall, Miss Julianne Michel, Mrs. Dana M. Raymond, Mrs. Elizabeth Rea, Mrs. John Rosenkrans, Jr., Mrs. Abbott Schlain, Mrs. Robert F. Shapiro, and Mrs. Otto C. Spaeth.

Also, during fiscal year 1985, the Archives gratefully received major grants of \$50,000 from the Henry Luce Foundation for national collecting projects, and \$25,000 from the Andrew W. Mellon Foundation to begin concentrated work on its collection of works on paper.

Edgar P. Richardson, who founded the Archives of American Art in 1954, died on March 27 of this year at age 82. A distinguished museum director and art historian, Dr. Richardson devoted much of his career to the study of American art well before it reached its present status of academic respectability. He was a prolific scholar and an active leader in the museum community. The Archives will remain a living monument to his vision.

Center for Asian Art

Freer Gallery of Art and Arthur M. Sackler Gallery

The Festival of India was the focus of programs for the Center for Asian Art in 1985. This national celebration of Indian culture and traditions included the Freer Gallery exhibition *The Arts of South Asia*, which displayed paintings and sculpture representing a complete survey of the Freer collection of art from the Indian subcontinent. In the show were two major recent acquisitions: a Rajput miniature painting (ca. 1660) and a thirteenth through fourteenth century bronze bull, Nandi, from south India.

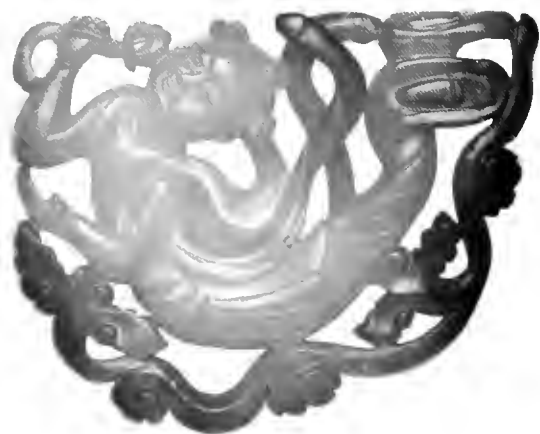
The Eighth Freer Medal was awarded by Freer Visiting Committee chairman Congressman Norman Y. Mineta to Dr. Stella Kramrisch for her lifetime contributions to the study of Indian art and culture. The award is "for distinguished contribution to the knowledge and understanding of oriental civilizations as reflected in their arts." The impetus of the Festival of India also prompted the Freer to reprint *The Adventures of Rama* by Milo C. Beach, assistant director of the Arthur M. Sackler Gallery. A number of copies were subsequently sent to India for distribution to schools and research institutes through the Indian Embassy.

Among the lectures in the thirty-second annual series was "Christian Scenes in Thirteenth Century Islamic Metalware," by Glenn D. Lowry, the new curator of Near Eastern art. Other lectures included "The 16th-Century Individualist Painter Hasegawa Tohaku," by Michael R. Cunningham, which was jointly sponsored with the Embassy of Japan, and "Ethical Problems in Conservation of Some Oriental Monuments," delivered by Lawrence J. Majewski, as the Rutherford J. Gettens Memorial Lecture.

The annual presentation in the John A. Pope Memorial Lecture Series was "Some New Aspects of Japanese Porcelain of the Seventeenth Century," by Hiroko Nishida of the Nezu Institute of Fine Arts, Tokyo.

Japanese exhibitions in the past year included *Japanese Calligraphy*, which demonstrated styles of writing developed during the eighth through the twelfth centuries; *Japanese Drawings*, including works by Hokusai (1760–1849) and Gyosai (1831–1889); *The Glazed Ceramic Tradition of Seto and Mino*, illustrated by some rare early pieces as well as by representative Momoyama period (1568–1615) wares; *Kyoto Ceramics*, presenting works by major Kyoto ceramic artists and workshops of the Edo period (1615–1868); and *Japanese Theater in the Edo Period*, featuring paintings on scrolls and a screen.

Chinese exhibitions included *Ming Dynasty Calligraphy and Painting*, comparing the works of forty artists of the Ming dynasty (1368–1644), and *Painting and Calligraphy from the Ch'ing Dynasty*, displaying thirty masterpieces of



Among the notable donations to the Freer Gallery of Art this year was this figure of Buddhist apsaras, Chinese jade, Sung dynasty, 907–1280, a gift of Hon. and Mrs. Hugh Scott.

the Ch'ing dynasty (1644–1911) as a sequel to the Ming show.

Near Eastern exhibitions included *From the Hand of Mani: Iranian Paintings from the Freer*, showing the development of an idiom in manuscript painting between the fourteenth and sixteenth centuries; and *The Riza-i Abbasi Album*, drawings signed by or attributed to the man acknowledged by art historians to have been among the greatest artists of Iran's Safavid empire (1502–1736). *Islamic Metalwork* is a detailed exploration of vessels, plates, ewers, weapons, and other objects in brass, silver, and gold, showing the development of metalwork from the seventh to eighth through the seventeenth centuries. An illustrated catalogue accompanied the exhibition.

As construction on the Sackler Gallery foundation and basic structure approached completion, design refinements to various portions of the new building have occupied the staff. This included particularly exhibition galleries, the museum shop, collection storage, and the library. Equipment and furnishings have had to be chosen as well. Refinements also continued for the development of the design for the Freer renovation to follow the relocation of the library and offices to the Sackler building.

A grant from the Rockefeller Foundation has made it possible to establish a Rockefeller Foundation Residency Program in the Humanities at the Smithsonian Institution. The grant, which supports residential fellowships in Asian and African art, will provide two to three postdoctoral appointments each year beginning in 1985 and continuing

Cooper-Hewitt Museum

through 1988. The first recipient of a Rockefeller Fellowship at the Center for Asian Art is Professor James L. Westcoat, who teaches in the Department of Geography at the University of Chicago. He will be resident at the Sackler Gallery in the summers of 1986 and 1987. Professor Westcoat's project is "In Gardens Watered by Running Streams: The Meaning of Water in Mughal Gardens at Agra."

The first purchase made for the Sackler Gallery Collection was a Japanese ceremonial lacquer palanquin (or carriage) of the late eighteenth to early nineteenth century. An extremely rare object in an American museum, this palanquin would have been used to carry a bride to her wedding, and the Sackler example shows the family crests of the two families (including the Tokugawa family which ruled Japan 1600–1868) to be joined.

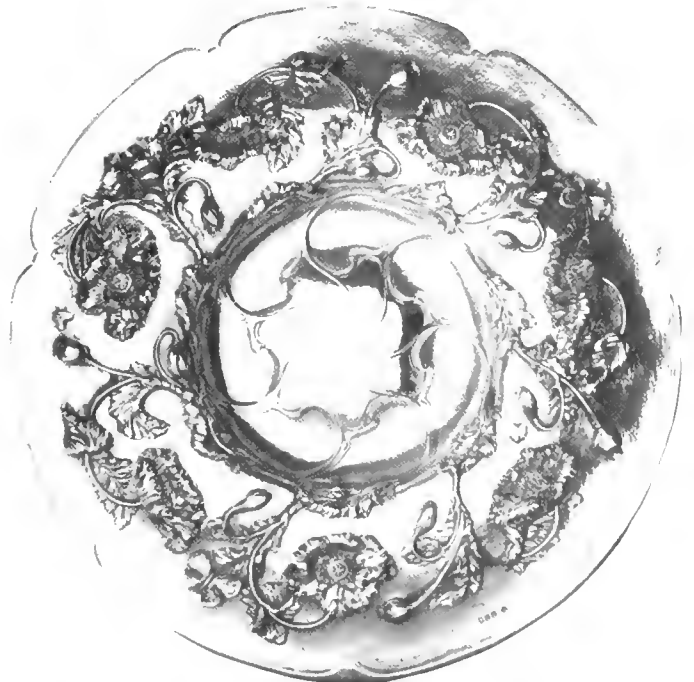
Other major acquisitions by the Freer Gallery included a pair of seventeenth-century Japanese screens and a seventh-century Sasanian metalwork dish, purchased with the first federal funds ever appropriated for Gallery collection objects. With trust funds, the Freer purchased Japanese ceramics, a wooden sculpture, calligraphy, paintings, and a bronze; Chinese calligraphy, painting, and a set of cricket cages; Indian painting; and a Korean pottery jar of the Old Silla dynasty (sixth century).

Donations to the Freer collections included Japanese ceramics, paintings, lacquer; Chinese bronze, ceramics, jade, glass, and painting; and Turkish calligraphy. Of particular note were a Chinese gray pottery wine container of the Shang dynasty, early Anyang period (thirteenth century B.C.) donated anonymously in memory of collector and connoisseur Helen Dalling Ling; Chinese jades of the late Neolithic period (ca. 5000–ca. 1500 B.C.) and the Sung dynasty (960–1279); a bronze and four glass objects of the Chinese T'ang dynasty (618–908) given by the Honorable and Mrs. Hugh Scott; and an eighteenth-century Edo period six-panel Japanese screen of the Kano school given by Mrs. Garnet Hulings. Among the donations to the library was a limited edition of *The Handmade Papers of Japan*, given by Mrs. Elizabeth Kelly Wyatt. The Sackler Gallery and the Center for Asian Art each received their first financial donations from the public this year.

The Cooper-Hewitt Museum, the Smithsonian's National Museum of Design since 1967, was founded in 1897 as a "working museum" resource for professional designers and students of the design arts. Its world-renowned wallcoverings, decorative art objects, textiles, and prints and drawings constitute the nucleus of a truly international center for the study of design.

Objects of Adornment: 5,000 Years of Jewelry from the Walters Art Gallery, Baltimore and European Illustrations: 1974–1984 were but two of many exhibitions shown this year. Figural representations of Europe, Asia, Africa, and North America were the theme of an unusual iconographic study *The Four Continents*, a project by a student in the museum's Masters Degree Program. *Celebration and Ceremony: Design in the Service of Wine*, a panoramic look at objects both ordinary and extraordinary, secular and sacred, was made possible by Moët and Chandon Champagne and Hennessy Cognac.

Asian arts were featured in *Fabled Cloth: Batik from Java's North Coast*, underwritten by the Mobil Oil Corporation, and *Chinese Gold and Silver from the T'ang Dynasty in American Collections*. American crafts and design traditions were the subjects of *Chicago Furniture: Art, Craft and Industry, 1883–1983* and *Art Pottery: A New Vista in American Ceramics*, which is now being cir-



This 1907 silver sideboard dish, signed "L. Morio," was added to the Cooper-Hewitt's collection this year. It is 22½ inches in diameter, hallmarked by Holland, Aldwinkle & Slater, London.

culated around the country under the auspices of the Smithsonian Institution Traveling Exhibition Service.

The museum's own holdings provided an important nucleus for *Cut Paper*, a survey of over 150 examples of this traditional art form, as well as three quarters of the works shown in *Old Master Prints from the Wallerstein Collection*, which was organized jointly by the Cooper-Hewitt, the Bell Gallery of Brown University, and the Seattle Art Museum. *Timeless Sources: Rare Books in the Cooper-Hewitt Collection* was shown simultaneously with *Carnegie Libraries: A Sesquicentennial Celebration*. This tribute to the philanthropy of Andrew Carnegie was especially appropriate in the Cooper-Hewitt which was built as Mr. Carnegie's residence.

In 1985 a handbook on the rare book collection and a unique volume on the design traditions associated with the history of wine were added to the Cooper-Hewitt's lengthy bibliography. A major grant from the J. M. Kaplan Fund was received which will help to provide critical seed money for future books. Two prior-year publications, *Cities: The Forces that Shape Them* and *American Enterprise: Nineteenth Century Patent Models* received design achievement awards from the National Endowment for the Arts' First Annual Presidential Design Awards Program. *The Amsterdam School: Dutch Expressionist Architecture 1915-1930*, a 1984 copublication of the Cooper-Hewitt and MIT Press, will soon appear in German and French language editions.

Collections management activities continued apace throughout the year. Refinement of collections storage and records, including photographic documentation of several collection groups (the latter funded by a grant from the New York State Council on the Arts (NYSCA)) continued.

Again in 1985, the Cooper-Hewitt offered statewide conservation advisory service for smaller museums throughout the state in an extensive program funded by NYSCA.

More than 5,000 persons attended the dozens of courses, seminars, tours, and workshops offered by the museum's Programs Department, several of which carried undergraduate degree credits at Parsons School of Design. Subjects ranged from Renaissance decorative arts to seaside resorts in America, the arts of Indonesia, and the history of English taste. For the sixth year, the museum participated in the popular Museum Mile Night which was inaugurated by Mayor Ed Koch. Seventeen graduate students received the master's degree in history of the decorative arts and design from the program which is jointly administered with the Parsons School of Design. Another twenty were accepted for enrollment for the 1985-86 academic year.



New York's Mayor Ed Koch speaks at the Cooper-Hewitt Museum during opening ceremonies of Museum Mile Night 1985.

Throughout the year, the museum received many acquisitions including gifts from dozens of generous private donors. Major purchases included a 1907 silver sideboard plate designed by L. Morio and made by the English firm of Holland, Aldwinkle, and Slater, and two 1874 drawings of the P. J. Hetzel house by the French architect Eugene Viollet-le-Duc.

One of the most exciting developments of this year was the sale of the 1965 Rolls Royce which was donated by John and Yoko Lennon for the museum's benefit in 1977. At auction, the vehicle fetched net proceeds of \$2,086,450 which have been placed in a special fund pending the outcome of a yet-to-be publicly announced capital campaign on the museum's behalf.

The year also saw a major decision by the Regents to seek legislation authorizing the appropriation of \$11.5 million as one-half of the amount required to fund renovation and expansion of the Cooper-Hewitt's present facilities. Legislation was subsequently introduced in the Senate and in the House of Representatives and hearings were held by appropriate committees. A national campaign committee is being formed to raise the balance of necessary funds and detailed architectural planning will move forward in 1986.

Hirshhorn Museum and Sculpture Garden

The Hirshhorn Museum and Sculpture Garden (HMSG), a major museum of contemporary art, maintained an active exhibition schedule and acquisitions program this fiscal year. Related programs of films, lectures, concerts, tours, and other educational activities for all museum visitors supported these programs. The museum's departments of conservation, registration, photography, and the reference library offer technical support to staff and scholars.

The Founding Director Abram Lerner retired October 2, 1984; he was succeeded by James T. Demetrian, former Director of the Des Moines Art Center, on November 1, 1984.

HMSG has organized many important exhibitions since it opened in October 1974: loan shows, with works borrowed from other museums and private collectors, and exhibitions drawn from the museum's extensive permanent collection.

An important showing of the museum's holdings, *European Modernism: Selections from the Collection of the Hirshhorn Museum and Sculpture Garden*, an exhibition of some seventy-five paintings, sculpture, and works on paper, was featured from September 13, 1984, through January 13, 1985. *Jim Dine: Five Themes*, which was on view from February 20 through April 28, 1985, was an intensive, mid-career retrospective for this American artist. Focusing on five themes (tools, robes, hearts, trees, and gates), the sixty-eight works included paintings, drawings, mixed media compositions, and sculptures. Two monumental hearts, never before exhibited, were sited on the plaza at the museum's entrance. Organized by the Walker Art Center, Minneapolis, the exhibition and national tour was generously supported by Best Products Co., Inc., and the National Endowment for the Arts. *Representation Abroad*, June 5–September 2, 1985, was curated by Joe Shannon. The exhibition focused on the strength and diversity of representational works by sixteen artists working in Australia, Columbia, France, Great Britain, Italy, Spain, and West Germany. The 147 works were by Avidgor Arikha, Arthur Boyd, Juan Cardenas, Tibor Csernus, Sandra Fisher, Klaus Fussman, David Hockney, Nino Longobardi, Antonio Lopez-Garcia, Leonard McComb, Luis Marsans, Francesco Messina, Rodrigo Moynihan, Wolfgang Petrick and, Isabel Quintanilla. *A New Romanticism: Sixteen Artists from Italy*, October 3, 1985–January 5, 1986, a major loan exhibition, was curated by Howard N. Fox. Focusing on a romantic, spiritual impulse in recent Italian art, artists were Roberto Barni, Ubaldo Bartolini, Carlo Bertocci, Lorenzo Bonechi, Patrizia Cantalupo, Sandro Chia, Enzo Cucchi, Gino De Dominicis, Stefano De Stasio, Paola Gandolfi, Tommaso Lisanti,

Carlo Maria Mariani, Sabina Mirri, Mimmo Paladino, Franco Piruca, and Marco Antonio Tanganelli. (Tour: Akron Art Museum, Ohio, February–April 1986). A grant from the Women's Committee of the Smithsonian Associates enabled the museum's conservation staff to present *Conservation of Modern Art*, February 2–March 31, 1985. The conservation of seventeen works from the museum's own collection was examined in detail, using the works themselves, didactic panels, and a slide presentation.

Smaller exhibitions, organized by HMSG curator of prints and drawings, Frank Gettings, were highlighted in the museum's second floor escalator lobby. Included were *Giacomo Manzu*, January 31, 1984–March 18, 1985; *20th Century Drawings from the Museum's Collection*, March 19–July 22, 1985; and *Prints and Drawings of the 60s from the Museum's Collection*, July 23–November 4, 1985.

In addition to creating its own exhibitions, the museum also lent 233 objects to sixty-two institutions this fiscal year. Among these were six sculptures by Chaim Gross to the Nassau County Museum of Fine Art, Roslyn, New York; five sculptures by Jacques Lipchitz to the Albert and Vera List Visual Arts Center, Massachusetts Institute of Technology, Cambridge, Massachusetts; and four paintings by Thomas Eakins to the Winterthur Museum, Winterthur, Delaware.



James T. Demetrian (left), director of the Hirshhorn Museum and Sculpture Garden, presents the Grand Duke and Duchess of Luxembourg with a catalog of the museum during their visit on November 14, 1984.



International loans included four photographs by Thomas Eakins to the Munchner Stadtmuseum, Munich, West Germany; one painting by Francis Bacon and one by Jackson Pollock to the Stedelijk Museum, Amsterdam, The Netherlands; one painting by Francis Bacon to the Tate Gallery, London, England; one watercolor by Robert Delaunay to the Musee d'Art Moderne de la Ville de Paris, Paris, France; and two Picasso sculptures to the Ministry of Culture, Madrid, Spain.

Four exhibitions of works on paper, totaling 176 works, have been loaned to Smithsonian Institution Traveling Exhibition Service: *Artists and Models: Portraits from the Hirshhorn Museum and Sculpture Garden*, through April 1987; *Aspects of Color: Works on Paper from the Hirshhorn Museum and Sculpture Garden, Smithsonian Institution*, through May 1985; *Raphael Soyer: Sixty-five Years of Printmaking, Selections from the Hirshhorn Museum and Sculpture Garden*, through March 1985; and *Genre Scenes: Works on Paper from the Hirshhorn Museum and Sculpture Garden*, through June 1987.

The Department of Education continued to bring the museum's exhibitions alive for a varied audience, ranging from elementary school children through senior citizens. With seventy-three docents, the department conducted tours for more than 13,000 visitors. The summer intern program successfully continued this year with six undergraduate students. Regularly scheduled free films about artists, by artist filmmakers, and a special program for young people are all vital aspects of the museum's outreach to the public.

Through its acquisition program, HMSG's permanent collection was enriched by eight gifts and nine purchases. Included were a large painting by William Beckman, *Diana IV*, 1981; Leon Golub's *Four Black Men*, 1984; *In the Infield was Patty Peccavi*, 1981, a mixed media piece by Edward and Nancy Kienholz; and Deborah Butterfield's monumental sculpture, *Horse*, 1985.

This year was marked by the publication of the fifth volume of the letterpress edition of the Joseph Henry Papers, documenting the years 1841-43, a period in Henry's life marked by intense experimentation, teaching, and a preoccupation with the qualitative development of the American scientific community.

Work has also proceeded on the sixth volume, the last dealing with Henry's years at Princeton, as well as the establishment of the Smithsonian Institution, the selection of Henry as Secretary, and his vision and plan for the Institution.

The project continued its sponsorship of the Nineteenth Century Seminar, hosting presentations which ranged over a broad spectrum of historical topics, including the history of science and technology, art, and American cultural history.

Henry Papers staff cooperated with other museums in the preparation of exhibitions, including the National Museum of American History for a 1987 exhibition *Newton in America*, and the National Museum of Natural History for the exhibition on the Wilkes Expedition to the South Pacific.

In addition, Henry staff made presentations at, among others, the XVIIth International Congress of History of Science and the History of Science Society. Nathan Reingold, acting as chair of the Commission on Documentation of the Division of Historical Sciences, International Union of the History and Philosophy of Science, organized an international conference on historical editing in the history of science.

This was the scene as Hirshhorn staffers put the first massive component of *Two Big Black Hearts* by American artist Jim Dine in place for its first public showing. Part of the traveling exhibition *Jim Dine: Five Themes*, the bronze hearts had been commissioned by a private collector and were later removed to another site. Dine is watching at far right.

National Museum of African Art

In fiscal year 1985 the National Museum of African Art progressed on many fronts simultaneously. Clear vision, new staff appointments, and cooperation with numerous areas of the Institution provided the background for increased activity and the impetus for implementing objectives needed for the forthcoming move to the National Mall. The advancement of the museum's mission, to bring public understanding of African art traditions and cultures, was strengthened by an active acquisitions program and several national and international loan exhibitions. These exhibitions placed the museum on a national circuit of touring exhibitions, where the most significant accomplishments in the field of African art are reviewed. And, while the lack of space in the current location forced the museum to turn away over 500 tours last year, improvements in the museum's educational components were made evident by the quality of resource materials available to the public and by the rostrum of distinguished scholars, foreign dignitaries, and museum-cultural administrators visiting and lecturing at the museum.

For the first time, the museum was able to make its collection and research facilities available for advanced scholarly research through a residency fellowship program administered by the Smithsonian's Office of Fellowships and Grants. The first recipient of the Rockefeller Foundation Residency Program in the Humanities is Dr. LaBelle Prussin, professor of architecture at the University of Washington, Seattle.

A three-year grant was awarded by The Morris and Gwendolyn Cafritz Foundation to support the planning and preparation of the major inaugural loan exhibition in the Quadrangle, *African Art and the Cycle of Life*.

This year three major loan exhibitions opened at the museum, each with scholarly catalogues. The first exhibition, *Praise Poems: The Katherine White Collection*, was organized and circulated by the Seattle Art Museum. Opening at the museum on October 31, 1984, fifty works of art from the White collection of African art enabled visitors to explore the meaning and aesthetics of African art.

Over 14,000 visitors in a nine-week period came to the museum to view *African Masterpieces from the Musée de l'Homme*, the major Spring exhibition presented under the patronage of the Ambassador of the Republic of France to the United States and organized by The Center for African Art, New York. One hundred world-renown works of art from west and central Africa drawn from one of the foremost collections of African art in the world formed a cohesive unit illustrating the history of collecting in France.

The first exhibition on the art of the Igbo-speaking people of southeastern Nigeria opened July 31, 1985. *Igbo*

Arts: Community and Cosmos was based on original fieldwork by Herbert Cole, professor of art history, University of California, Santa Barbara, in collaboration with Chike C. Aniakor, professor of art, University of Nigeria, Nsukka. More than 100 works of Igbo art from museums and private collections in the United States and abroad, including Nigeria, were assembled to show the variety of traditional arts among the Igbo.

In fiscal year 1985 the museum was fortunate to add to its collection eighty-five works of art, including fifty-four objects acquired through gift and thirty-one objects acquired through purchase. The holdings were enriched by the donation of a private collection of thirteen works of art from sub-Saharan Africa, including figures, utilitarian objects, headdresses, and amulets. A unique and well-documented sculpture in the donation is a life-size Bamum memorial grave figure, dated 1908. Carved in wood and embellished with extraordinary beadwork, its origin is the grassfields of Cameroon. Other gifts to the museum include examples of west and central African metalwork and figurative sculpture from Mali, Nigeria, and Zaire. As the museum prepares to move to its new headquarters, a highly concentrated effort to strengthen the permanent collection continues. This year, the first group of objects of art consisting of twenty works from a private European collection was purchased with Trust funds.

Other noteworthy objects acquired through purchase during the year include: a Yoruba (Nigeria) ivory female figure purchased with funds provided by a grant from the



Sylvia Williams (left), director of the National Museum of African Art, is shown with His Excellency Emmanuel de Margerie, Ambassador of the Republic of France, and Mrs. John Pope, of the International Exhibitions Foundation, at the opening reception for *African Masterpieces from the Musée de l'Homme*, April 9, 1985. (Photograph by Kim Nielsen)

James Smithson Society; two Topotha beaded hats (Republic of the Sudan) for which funds were donated by the Friends of the National Museum of African Art; and an Akan, Twifo-Hemang terra-cotta head (Ghana).

During the year the museum appointed a full-time, permanent conservator, Stephen Mellor, and an exhibition designer, Richard Franklin. In addition, assistant registrar, Mary Lawson, was appointed to further the implementation of sound collection management procedures. Under the management of the museum's fine archivist, Judith Luskey, the Eliot Elisofon Photographic Archives assessed projects and took inventory of all resource material in the department. Three of the many significant donations received during the year are 2,500 field photographs taken in Nigeria and the Congo, 1949–59; a collection of photographs from Cameroon; and a collection of east African photographs and a film on the archaeological site, Great Zimbabwe.

The department of education and research conducted 250 school tours, more than 100 workshops and 100 outreach programs. The Shell Companies Foundation awarded a gift in February 1985 enabling the department to begin a publication series, the first of which is titled *The Art of African Kingdoms*. In addition, a grant received from the Women's Committee of the Smithsonian Associates enabled the museum to continue two educational outreach programs, "Animal Symbolism" and "African Music."

In conjunction with major exhibitions, art historians, musicologists, and historians delivered lectures. Among the museums and universities represented were: University of Miami, Cleveland State University, University of Virginia, Yale University, University of Wisconsin, University of Pittsburgh, Atlanta University, Governors State University, Georgetown University, Hunterian University (Scotland), Horniman Museum and Library (England), and Università Internazionale dell'Arte (Italy). As part of its commitment to foster the use of the collection and its research facilities, the museum had in residence four scholars through the Office of Fellowships and Grants. The scholars were: Eli Bantor, Indiana University; Elisha Renne, University of Minnesota; Blythe Follet-Colon, University of Connecticut; and Sharon Patton, University of Maryland.

This unique and unusually well-documented sculpture was donated to the National Museum of African Art, a gift of Evelyn A. J. Hall and John A. Friede. The sculpture is a life-sized Bamum (Cameroon) memorial grave figure, carved in wood and embellished with extraordinary beadwork, dated 1908.



National Museum of American Art

Identity and Purpose

With a collection begun in 1829, the National Museum of American Art (NMAA) is devoted to the acquisition, preservation, study, and exhibition of American painting, sculpture, graphic art, and crafts. The Renwick Gallery, established separately in 1972 under the purview of NMAA, displays American crafts and decorative arts as well as exhibitions of work from abroad. In addition, the Barney Studio House is maintained by NMAA as a period home open for tours and for special interpretive programs.

Programs & Projects

The major commitment of the NMAA is to the preservation, research, and presentation of its permanent collection. Many of the museum's exhibition and education programs result from this priority.

NMAA's exhibition program highlighted special aspects of the work of well-known artists and introduced the work of distinguished but lesser known artists, representing the breadth of American creativity. *Sharing Traditions: Five Black Artists in Nineteenth-Century America* featured forty-nine works, the majority from the NMAA's extensive collection of Afro-American art, by five artists who were acclaimed in their time and contributed significantly to the mainstream of American art. Organized by Lynda R. Hartigan, the accompanying catalogue contributed fresh research to the field of black studies. Drawn from the NMAA's extensive holdings of the artist's work and based on repeated interviews, *Werner Drewes: Sixty-Five Years of Printmaking*, a retrospective of the printmaker's work was prepared by curator Martina Norelli. *Homage to Franz Kline: Photographs by Aaron Siskind*, an exhibition undertaken by Merry Foresta, included forty-eight photographs inspired by Kline's abstract expressionist paintings and the friendship that existed between the two men. *Creation and Renewal: Views of Cotopaxi by Frederic Edwin Church*, organized by guest curator and former Smithsonian Fellow Katherine Manthorne, was the first exhibition devoted to Church's South American work—the paintings that won him fame in the nineteenth century and upon which his reputation firmly rests today. Organized by Lloyd E. Herman, *The Woven and Graphic Art of Anni Albers*, opening on the artist's eighty-sixth birthday, celebrated her pioneer work in the medium of fine art weaving in America. *The Martha Jackson Memorial Collection*, exhibition and catalogue prepared by Harry Z. Rand, featured works championed by the unorthodox New York



gallery dealer, perhaps best known for encouraging abstract expressionism.

Educational outreach included a series of six programs presented at the Barney Studio House, among them "English Song and Poetry" and "A Shakespearean Feast." Made possible by a grant from the Metropolitan Life Foundation, a symposium and lectures accompanied the exhibition *Sharing Traditions: Five Black Artists in Nineteenth-Century America*. A panel discussion cosponsored by the Smithsonian Resident Associates in conjunction with the opening of *LIFE: The Second Decade, 1946–1955* included *LIFE* photographers Edward Clark, Alfred Eisenstaedt, Martha Holmes, John Loengard, Carl Mydans, and John Phillips who reminisced about their work with the magazine that revolutionized photo journalism. Finally, a group of scholars convened in a panel to discuss "The Lithographs of James McNeill Whistler," the symposium accompanying an exhibition of the same name.

Accessions and Deaccessions

NMAA acquired *Achelous and Hercules*, a major mural by the significant American artist, Thomas Hart Benton (1889–1975). This large painting, of egg tempera on canvas (63 × 262 inches), was a gift from Allied Stores Corporation and a museum purchase through the Smithsonian's



Thomas Hart Benton's *Achelous and Hercules* of 1947 was acquired this year by the National Museum of American Art, a gift of Allied Stores Corporation and museum purchase through the Major Acquisitions Fund, Smithsonian Institution.

Collections Acquisition Program. It is among the artist's most forceful and successful compositions and a splendid example of Benton's ability to raise the American experience to the level of myth.

Other outstanding objects among approximately 930 items accessioned this year included Lorser Feitelson's *Genesis #2*, the most famous painting of the little-known California movement, "Subjective Classicism: Post-Surrealism"; Albert E. Gallatin's *May Composition*, and Gene Davis's *Prince Albert*. Distinguished works by earlier artists included Charles Sprague Pearce's *Lamentation Over the Death of the First-Born of Egypt*, 1877; Edward Mitchell Bannister, *Tree Landscape*; a portrait of a white woman by George Catlin; Jasper Francis Cropsey's expansive view *The Coast of Genoa*; and Edmonia Lewis's *Moses (after Michelangelo)*.

Reflecting NMAA's commitment to photography, approximately 300 photographs were acquired, including Edward Weston's *Pepper, No. 30*, 1930, and Robert Mapplethorpe's *Andre*, 1984.

Fine decorative arts objects acquired by the Renwick Gallery included Cynthia Schira's *Reflections*, 1982, a four-panel weaving using fibers and metallic threads, and by the prominent glass artist, Harvey K. Littleton, *Opalescent Red*, translucent colored rods with clear crystal overlays arranged sculpturally to suggest organic growth.

NMAA received 311 paintings, sculptures, drawings, and collages from Container Corporation of America

which is headquartered in Chicago. Each of these modern works of art was commissioned by the corporation and reproduced in its advertising programs inaugurated in 1937. The collection includes many individual works of major importance and, collectively, it documents a corporation's leading role in the cultural life of our nation. As a body of work, it enriches the museum's documentation of modern graphic design and its relationship to the fine arts in America.

Additional groups of works acquired by the museum included twenty-six collages by Joseph Cornell, gift of his sister Mrs. John A. Benton; eighty prints by Howard Norton Cook, gift of his widow Barbara Latham Cook; thirty-nine prints by Louis Lozowick, gift of his widow Adele Lozowick; six photographs by Man Ray, gift of his widow, Mrs. Juliet Man Ray; and four sculptures by Bruce Moore, gift of his widow Alice H. Moore.

The NMAA was established to preserve, research, and display art of the United States. In an attempt to define and focus this purpose more carefully, the museum's Commission approved the deaccessioning of twenty-four works of non-American origin, as well as fifty-five paintings that substantially duplicate other works by the same artist which are superior in quality, or others of comparable subject, format, style, or period. The proceeds realized from sale at public auction are to be used solely for purchase of new acquisitions.

National Museum of American History



Aaron Siskind, Dr. Charles C. Eldredge, director of the National Museum of American Art, and Mrs. Nan Tucker, chairman of the museum's commissioners, at a December 1984 preview of *Homage to Franz Kline: Photographs by Aaron Siskind*.

Activity Changes

In fiscal year 1985 the museum began a one-year pilot project to develop a research data base for a projected Inventory of American Sculpture. The initial project, made possible by a grant from the Henry Luce Foundation, will allow the museum to automate the University of Delaware's Index of American Sculpture. Following the pilot, the museum plans an intensive five-year program to seek and record sculpture in public and private collections throughout every region in the United States. The sculpture inventory will augment NMAA's other computerized research resources, which constitute the most complete data base on the subject of American art in existence.

Facilities

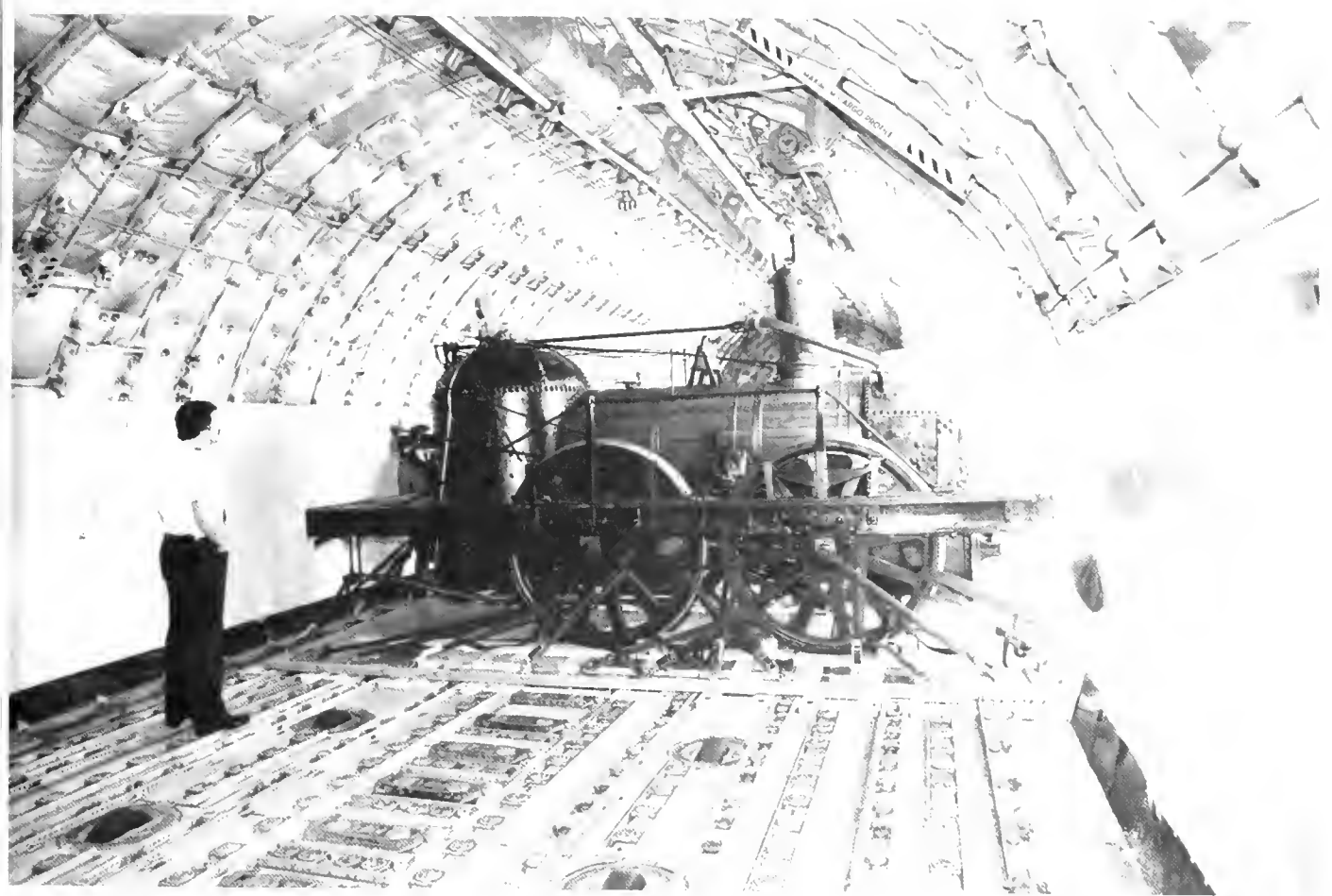
Restoration of the Renwick Gallery's stone copings and facade continued through the year and was completed in January 1986.

In fiscal year 1985 the National Museum of American History (NMAH) continued its dedication to the collection, care, study, and exhibition of objects that reflect the experience of the American people. The museum also offered a broad spectrum of lectures, concerts, and other programs which interpret that experience.

The exhibition program opened in the Dibner Gallery in October with *European Roots of American Pharmacy*. The instruments, paintings, drug containers, and other objects on view showed how the tools and practices of the European apothecary have become embedded in the fabric of American pharmacy. Ramunas Kondratas of the Division of Medical Sciences organized the exhibition. From mid-December to the close of the holiday season the annual *Trees of Christmas* exhibition lent a festive air to the building. Trees provided by the Department of Horticulture were decorated by volunteers with handmade ornaments exemplifying a traditional style. The Department of Public Programs also presented its annual Holiday Celebration from December 26 to 31. This celebration of America's ethnic heritage drew on the talents of more than six hundred participants from local ethnic communities and attracted more than 115,000 visitors.

In January *Spanning Niagara: The International Bridges, 1848-1962* opened in the first floor special exhibition gallery. More than seventy photographs, drawings, and lithographs illustrated the technical and esthetic challenges faced by the designers of the thirteen bridges built over the Niagara River. The exhibition was made possible by a grant from the New York State Council on the Arts. Ralph Greenhill organized the exhibition in Toronto; it was presented here under the curatorship of Robert M. Vogel of the Division of Civil and Mechanical Engineering. From May to August the Dibner Gallery housed *Celestial Images: Astronomical Charts 1500-1900*, which traced the evolution of decorative astronomical charts. Several celestial globes, an armillary sphere, an orrery, and a comitarium accompanied the more than thirty star charts and celestial atlases in the exhibition. Developed by Patricia M. Burnham at Boston University, its showing at NMAH was organized and curated by Deborah J. Warner of the Division of Physical Science. A rare silver wine cup that belonged to Governor William Bradford of the Plymouth Bay Colony was placed on exhibition in June for a three-year showing. The cup, made in London in 1634 and inscribed with the initials "WB," was purchased jointly by the museum and the Pilgrim Society of America.

For the second year, the Resident Associate Program sponsored a program to teach graphic arts techniques to students in secondary schools. During the summer, an



Here is the *John Bull*, the world's oldest operable locomotive, aboard an airplane for its journey from the National Museum of American History to Texas for display at the opening of the Dallas Fine Arts District in April 1985.

exhibition of works by these students, *Discover Graphics*, was especially popular among younger visitors to the museum. The Singer Sewing Machine Company recently donated a large collection of drawings, models, and machines documenting the evolution of the design of their products since the 1930s. *Industrial Design: An American Case History*, which opened in July, comprised a selection of these drawings and the machines they represented. Barbara Janssen of the Division of Textiles organized the exhibition. This year's version of *History as Seen from NMAH*, an annual exhibition composed of photographs taken by Smithsonian staff photographers, also opened in July. The exhibition covered events from around the Mall and nearby, such as the unveiling of a statue at the Vietnam memorial, protests and demonstrations on the Mall,

and the inaugural activities of early 1985. The museum commemorated the fortieth anniversary of the dropping of the first atomic bomb in *Building the Bomb: Forty Years After Hiroshima*, which related the history of the Manhattan Project through photographs, documents, and artifacts from Hiroshima and Nagasaki. Also on view were bomb casings of "Fat Man" and "Little Boy," nicknames for the bombs dropped on Nagasaki and Hiroshima, respectively. Consultant Stanley Goldberg wrote and assembled the exhibition. NMAH participated in the Festival of India in September with *Aditi: The Monies of India*, produced by the National Numismatics Collection. The exhibition presented examples from the museum's collection of Indian coins, one of the finest in this country. The popular "Case of the Month" program of small

exhibitions continued in 1985. *Presentation Swords* exhibited several elaborately decorated swords presented to figures such as General Ulysses S. Grant and General John J. Pershing in recognition of their services to this country. Black History Month saw the opening of *A Constellation of Black Sports Stars*, which examined the history of black participation in major American sports. Two of the objects were a recent gift by the Harlem Globetrotters. Commemorated anniversaries included the centennials of the Pilot Boat Association, the Visiting Nurse Association, and the birth of Al Jolson, and the 50th anniversaries of the passage of the Rural Electrification Act and the Soil Conservation Act.

The first of the museum's major reinstallations, *After the Revolution: Everyday Life in America, 1780-1800*, neared completion on the second floor. The exhibition, to open in November 1985, explores the lives of ordinary people who lived in America in the final two decades of the eighteenth century. Various sections of the exhibition examine the daily lives of a Delaware farm family, a Virginia planter family, a Yankee merchant family, and of the people of three larger communities—the Seneca Nation of the Iroquois Confederacy, African-Americans in the Chesapeake, and the busy seaport of Philadelphia. Two study galleries, designed to provide room for temporary, smaller exhibitions within *After the Revolution*, display objects from the Divisions of Costume and of Ceramics and Glass that enable visitors to examine in detail the techniques artisans used to create the objects and the evolution of their design. For foreign visitors selected labels from the exhibition have been translated into French, German, Japanese, and Spanish and will be available at the entrance. Demolition and production have begun on the first floor in preparation for the second exhibition in the museum's major reinstallation program, *Engines of Change: The Industrial Revolution in America*.

The museum also contributed to shows elsewhere in fiscal year 1985. G. Terry Sharrer of the Division of Agriculture and Natural Resources curated and coordinated the exhibition *American Anthem*, created for the opening of the Dallas Fine Arts District in April and continuing through October of 1985. This exhibition included some of the most important objects from the museum's collections, such as the *John Bull* locomotive, the compass of William Clark of the Lewis and Clark expedition, and the furniture from General Robert E. Lee's surrender at Appomattox.

In addition to researching and organizing exhibitions large and small the two major curatorial departments of the museum moved forward with the scholarly work of investigating American history, publishing articles, acquir-



The first laser, constructed by Theodore Maman at Hughes Research Laboratories in 1960, sparked a series of discoveries and applications described in *The Laser at 25*, a traveling exhibition organized by the National Museum of Natural History, and produced by the Smithsonian Institution Traveling Exhibition Service in 1985.

ing new objects, and sponsoring and attending symposia, conferences, lectures, and other special events. The Department of Social and Cultural History continued work on its high priority of reinstalling the large thematic exhibitions on American social, cultural, and political history, including *After the Revolution*. The concept statement for the nineteenth-century *Life in America* exhibition was refined and expanded, and the department produced several smaller displays this year, including *A Share in America*, which comprised a selection of paintings used as the basis for posters, billboards, and other advertisements encouraging Americans to buy bonds and savings stamps.

The Bradford Cup, the Singer Archives, and a model of Louis Robert's first papermaking machine (1801) were important acquisitions for the department; other acces-

sions included forty-five examples of eighteenth-century Meissen porcelain; many significant pieces of nineteenth- and early twentieth-century furniture; four printing presses; the Swain collection of thirty-five European and American flutes; and a complete collection of television commercials from the Reagan-Bush 1984 campaign.

Department staff organized or cosponsored many programs during the year: a one-day symposium on Eleanor Roosevelt; a Conference on the History of Music in America (with the Department of Public Programs); and a meeting of the Comité International des Musées et Collections d'Instruments de Musique. Several staff members received grants for scholarly work, including a Guggenheim Fellowship of \$17,000 for Cynthia Hoover of the Division of Musical Instruments to devote one year to writing a book on the piano in America; an \$87,000 grant to John Hasse, also of Musical Instruments, from the Indiana Historical Society for a two-year research project on the songwriter Hoagy Carmichael; and a grant of \$42,500 from the Goldsmith Foundation in New York to Richard Ahlborn of the Division of Community Life (with Gus Van Beek of NMNH) to catalogue the Judaica collection at the Smithsonian.

Many members of the department gave lectures at seminars and other programs across the country. A partial list includes Sheila Machlis Alexander, "The Collections Manager at the National Museum of American History—Development of a Museum Profession," at Hood College, Frederick, Maryland; Claudia Kidwell, "Men and Women: Dressing the Part," Phoenix Art Museum; Eugene Ostroff, "The History of Tintyping," at the conference of the European Society for the History of Photography, Bradford, England; and Edith Mayo, "Political Images of Women in Suffrage and the ERA," to the Women's Study Program at Princeton University. The Collections Management Office staff assisted the division with inventory maintenance of records and the processing of new accessions, adding more than 7,000 records of new accessions and location changes to the inventory computer file. The backlog of more than 5,000 objects awaiting registration, processing, and inventory was eliminated.

The Department of the History of Science and Technology continued with its plans for the reinstallation of its major exhibition galleries. The script and first-stage design for *Engines of Change: The Industrial Revolution in America* were completed in 1985 and the manuscript for the book that will accompany the exhibition was finished. Construction began for the reinstallation of the *John Bull* locomotive in its new location as an introduction to *Engines of Change*. The department also launched major

planning and fund-raising efforts for other sections of the reinstallation program, including a new hall on the information revolution and a reinstallation of the Medical Sciences exhibition, with a new emphasis on public health and the concepts of disease. The department concluded a successful fund-raising effort with the DuPont Company for the production of an exhibition on the history of materials and materials science, which will serve as a general introduction to the museum.

The past year also saw the development of a comprehensive American Indian program administered through the department, funded through a Public Service Outreach grant, and planned and initiated by Rayna Green. The project this year helped to produce a section on the Seneca Nation as part of *After the Revolution*; two staff training seminars; Folklife Festival presentations on Indian cultural preservation; and planning for a major teachers' conference on American Indian history.

Other initiatives of the department included the Ninth Annual Symposium in the History of Mathematics, held at the museum in October 1984, organized by Uta Merzbach of the Division of Mathematics, and a cooperative seminar and publications venture on the history of technology with the history department of West Virginia University. The department was also host to several international museum delegations, including those from the Soviet Union, the People's Republic of China, and France.

Among the department's acquisitions this year were the NASCAR "Grand National" Pontiac driven by Richard Petty to his 200th NASCAR win; a granite "sleeper" (stone block) from the first railroad in the United States; a rare nineteenth-century cotton gin from Forsyth, Georgia, in excellent condition; many objects in the field of biotechnology; and a camp chair used by General U.S. Grant during the Civil War.

Members of the department spoke at seminars and conferences across the country and internationally. A partial list includes Roger White, a lecture on recreational vehicles at the museum and at the University of Delaware; William L. Withuhn, "A Look to the Future," keynote address at the 50th Anniversary Convention of the National Railway Historical Society; and Ramunas Kondratas, "Collecting and Interpreting the Artifacts of Biotechnology," at the International Congress of the History of Science, University of California at Berkeley. The department continued its effort to automate its collection, the rehousing of some of its transportation vehicles at Silver Hill, and its move out of basement storage areas to consolidate and protect collections.

The Department of Public Programs, created as part of

last year's reorganization of NMAH, moved in new directions to provide expanded educational services and continued to produce a series of public programs and concerts that contributed new perspectives on current exhibitions and topics related to the national collections. The department's Education Office worked with staff members of the Department of Social and Cultural History to develop a learning facility for family groups within the new exhibition *After the Revolution: Everyday Life in America, 1780-1800*. This facility, called the Hands on History Room, will allow visitors to explore the methodologies of historians through sixteen self-directed activities. The office also continued to oversee the activities of some two hundred volunteer docents who conducted programs for nearly 80,000 museum visitors during the year, and to produce biweekly Saturday After Noon programs for family visitors.

The department's Program in Black American Culture presented combined colloquia and concerts on "Women in Blues" and "Music of the Black American Composer." "The Art of Jazz Improvization," which featured a lecture by Dr. Leonard Goines, a discussion with several artists and scholars, and performances by Doc Cheatham, Clark Terry, and Archie Shepp, was a joint effort between the Program in Black American Culture and the Frank Nelson Doubleday Lecture Series. These colloquia-concerts presented original research in Black American musical culture conducted by the program staff.

The Chamber Music Program, which comprises the Smithsonian Chamber Players, the Smithsonian String Quartet, and the Smithsonian Chamber Orchestra, had its most active season to date, with twenty-eight concerts at the Smithsonian and tours by the museum's resident ensembles to Europe and throughout the United States. The expanded Smithsonian Chamber Orchestra also began preparation for a six-record Mozart recording project already in progress for the Smithsonian Institution Press. Support for these programs came from the SI Press, the National Associate Program, and the Resident Associate Program, which coproduced the Chamber Orchestra, Smithsonian String Quartet, and the Chamber Players' Baroque Heritage series. The chamber music program reached more than five million listeners beyond the museum walls through broadcasts of its concerts produced by WBUR (Boston) on National Public Radio and by KSNJ (St. Paul) for the American Public Radio network.

The Department of Public Programs presented several other regular series including Music: An American Sampler; Jazz in the Palm Court, produced by the Program in Black American Culture; Palm Court Cameos of turn-of-



After the Revolution: Everyday Life in America, 1780-1800 is a major presentation of artifacts suggesting new perspectives on the changes confronting Native Americans, Europeans, and African Americans during this nation's formative years. The utensils shown here are in the section "The Farm Family, New Castle County, Delaware." National Museum of American History. (Photograph by Kim Nielsen)

the-century popular and light classical music; America on Film, a free film theater cosponsored by the Smithsonian Women's Committee and the Smithsonian Resident Associate Program; and twelve outdoor concerts staged in the National Bandstand. The department also played a major role in organizing, overseeing, and contributing to the Smithsonian's "Conference on Music in America," held May 2 to 4. The conference brought together some fifty artists, scholars, and organizational representatives to discuss the Smithsonian's role in the research and presentation of American musical forms.

At the National Numismatic Collection the year began with the publication of executive director Elvira Clain-Stefanelli's *Numismatic Bibliography* by Battenberg Verlag in Munich, Germany. In addition to *Aditi: The Monies of*

India, the staff produced an exhibition of Arizona-related numismatic material featured at the Tucson Convention in January, and twenty exhibit cases highlighting coins from the collections for the national convention of the American Numismatic Association in Baltimore.

Staff members completed the editing, organization, and indexing of the 268 microphotography rolls comprising some 194,000 frames, took over the photographing of new accessions this year, photographed roughly 2,800 specimens accessioned in 1984 and 1985, and set up a rudimentary darkroom to fulfill many photographic requests of the staff in-house. Through a grant awarded by the Research Opportunities Fund, Cory Gilliland traveled to Stockholm, Sweden, to deliver a paper at the congress sponsored by the International Federation of the Medal. Raymond Hebert traveled to Amman, Jordan, in March to deliver a paper at the fourth Bilad Ash-Sham Conference, and Leopold Cancio, our volunteer specialist, was awarded the Ruiz de Larramendi Medal of the Asociacion Numismatica Española for the best numismatic article of 1984. This year's accessions totaled 76 and comprised 3,632 objects; among these were 110 U.S. coins, including a rare original Confederate States of America cent struck in copper-nickel, and 16 colonial and early American paper money items.

The staff of the National Philatelic Collection spent much of last year processing and cataloguing the backlog of past accessions prior to the reinventory and the establishment of the Master Collection, which began in mid-summer. The addition of a special alcove adjacent to the Hall of Postal History and Philately helped improve the security and display the nation's philatelic treasures. A research center was created to aid visiting scholars using the specimens and reference collections. Following the completion of the research center, librarian Nancy Pope began organizing and shelving the library collection, the largest of its kind in the world.

The staff of the collection organized two Cases of the Month this year—*King of Hobbies . . . Hobby of Kings*, about the history of stamp collecting, and *Benjamin Franklin and the Colonial Posts*—and participated in many seminars, courses, and lectures. James H. Bruns gave an interview for Radio Smithsonian on animals and the mails, and presented a four-session Smithsonian Studio Arts course. Executive director Herbert Collins presented several lectures during the year on the early history of the Smithsonian Institution, and Reidar Norby spoke on the rarities of the collections. A special search for three-dimensional objects led to the acquisition of a 1941 Model AA Parcel Post truck and a three-wheeled van used in the

1960s; other important acquisitions included Russian Zemstov and Russian Imperial postage stamps and covers and ten colonial postal documents.

During fiscal year 1985 the Division of Conservation emphasized projects to reduce the backlog of conservation problems found in many collections. Major collections given such attention included patriotic posters of World Wars I and II, glass photographic plates depicting the motion studies of Eadweard Muybridge, and regimental flags of the Civil War. All told, the division examined, treated, or rehoused more than 3,000 objects. Conservation work request and reporting records were converted to a WANG PC database, allowing greater administrative efficiency with no increase in clerical staff.

The division aided in the training of NMAH staff through the organization of lectures and hands-on workshops on "Care, Storage, and Handling of Photographic Collections" and "Museum Pests: Their Identification and Control," and guidance on cleaning methods to NMAH curatorial and exhibits staff involved in the maintenance of permanent exhibition areas. Head conservator Scott Odell gave a week-long series of lectures on "Conservation Administration" and "Functional Objects Conservation" to Canadian Park Service and National Museum staff in Ottawa.

In fiscal year 1985 the Office of the Registrar established an Office of Central Catalog, hiring and training five technicians to work with automation of collections information. Their work supports inventory maintenance, refinement, and collections research. Record Files have reoccupied their space vacated due to asbestos contamination and have subsequently upgraded records storage systems. The loan program remained understaffed throughout most of the year, but despite this provided support to special exhibits and processed more than 1,400 loan transactions involving 12,000 objects. This year a full staff in the Objects Processing Facility made possible significant progress in reducing backlogs and establishment of two staging areas that support major exhibitions and acquisitions. The past fiscal year saw major progress at Silver Hill where the office is directly responsible for more than 1,000,000 objects. The office continued the five-year cleaning project for asbestos-contaminated objects and the rearrangement of storage to accommodate building renovations and facilitate loans. The Office of the Registrar has grown with the addition of responsibility for Silver Hill, inventory, and central catalog functions; staff and budget doubled in fiscal year 1985.

The Computer Services Center, previously a part of the Office of the Registrar, became a separate entity during the

year. A major effort was undertaken with the purchase of the WANG VS 100 minicomputer early in the year to acquire WANG Professional Computers (PCs) to be used both as stand-alone microcomputers and as VS 100 terminals. The year began with fifteen WANG terminals tied directly to the VS 100 and ended with 60 microcomputers and terminals available to staff.

An expert in museum space planning, David W. Scott, has been engaged to develop a master space plan for the museum as well as to help coordinate major renovations of the building's climate control and fire protection systems with the reinstallation of public spaces projected over the next several years. Work will affect the entire building and has to be coordinated with the ongoing removal of asbestos at Silver Hill, the projected move to the Museum Support Center, and commitments to the public. Planning is being conducted in cooperation with the Smithsonian's Office of Design and Construction and contracted architects and engineers. The coordinated construction schedule and the long-range plan should be completed during fiscal year 1986.

At the Archives Center staff members organized and rehoused items in more than two hundred boxes of business ephemera in the Warshaw Collection of Business Americana and produced written "finding aids" to the collection. The center is also preparing the Donald Sultner-Welles Collection of some 100,000 photographs of people, architecture, and general scenes for research use. With funding from the Smithsonian Regents and the National Endowment for the Humanities, historian Spencer Crew continued work on *Field to Factory: Afro-American Migration, 1915-1940*, the first exhibition in a major museum on this important demographic movement. After three years of planning and months of testing equipment and procedures, staff members have begun to enter descriptions of archival collections into the Smithsonian Institution Bibliographic Information system (SIBIS). Fully implemented, the system will enable researchers across the country to learn quickly of the holdings of the Archives Center and other archival units. The new additions to the center's holdings, which now comprise 173 collections, range from a nearly complete set of television commercials from the Pepsi-Cola Company to the research files, unpublished manuscripts, and thousands of photographs of Carl de Wendler-Funaro, a lifelong student of American Gypsies.

The major work of the Afro-American Communities Project during the year was the collecting of wills, the investigation of more than four hundred probate records, and extensive analysis of probate and demographic data

from the antebellum black community of Cincinnati. Biographical information on Cincinnati blacks has been compiled to augment the probate data and a database and code book for analyzing the probate data produced. The Director of the Afro-American Communities Project, James O. Horton, presented several lectures last year, including "Black Americans and the Constitution during the Nineteenth Century," at Catholic University, Washington, D.C., and "Teaching Race and Gender in the Classroom," Race and Class Conference, William Patterson College, Wayne, New Jersey.

The Project on the Vietnam Generation is a private, nonprofit organization established in January 1985 and housed in the National Museum of American History. The project is a network of more than five hundred scholars, journalists, clergy, and others interested in studying how the Vietnam War and other events of the 1960s and early 1970s affect the actions and attitudes of the sixty million Americans who came of age during that time. Last year's efforts included a survey of college and university courses on Vietnam events; a quarterly newsletter; and planning for a conference in 1986. Contributors to the project as of August 1985 included The Ford Foundation, members of the Rockefeller family, and the Episcopal Church.

National Portrait Gallery

Among the major exhibitions presented this year at the National Portrait Gallery (NPG) was a show of the witty caricatures of Mexican artist Miguel Covarrubias. Covarrubias came to New York in the early 1920s and soon was publishing his visual comments on the American cultural scene in the *New Yorker* and *Vanity Fair*. Original drawings and paintings for both previously published and unknown caricatures were exhibited. Part of this exhibition was sent in February 1985 to the San Angelo Museum of Art, Texas, for the inaugural show of the new museum.

Other noteworthy exhibitions this year included *Peace and Friendship: Indian Peace Medals in the United States* which illustrated the significant role the medals played in relations between native Americans and the U. S. Presidents. It brought together for the first time examples of all the peace medals issued by the United States Government. This exhibition subsequently traveled to the Buffalo Bill Historical Museum in Cody, Wyoming, the Joslyn Museum of Art in Omaha, Nebraska, and the Denver Museum of Natural History. *Joseph Wright, American Artist, 1756-1793*, prepared by staff curator Monroe H. Fabian, examined the work of a man who was the first American-born artist to study at London's Royal Academy, the first to sculpt George Washington, and the first engraver to the U. S. Mint. *A Truthful Likeness: Chester Harding and His Portraits*, by guest curator Leah Lipton, and *William Edward West: 1799-1857, Kentucky Painter*, reexamined the work of these two neglected mid-nineteenth century artists and underscored the richness and diversity of their portrait work. The Harding and West exhibitions were shown simultaneously first at NPG and then at the J. B. Speed Museum in Louisville, Kentucky, while the West exhibition was on view at the Lauren Rogers Museum, Laurel, Mississippi, during the summer of 1985. *Baseball Immortals: The Photographs of Charles Martin Conlon 1915-1935* was selected from nearly 7,000 glass plate negatives in the collection of the *Sporting News*, the nation's oldest sports publication. After its opening in October 1984 at the NPG, the exhibition began a national tour under the auspices of the Smithsonian Institution Traveling Exhibition Service. The other large photographic exhibition presented this year was *Metropolitan Opera Centennial: A Photographic Album*, a loan show from the Metropolitan Opera chronicling the great moments in the history of that institution.

Two exhibitions focussed on individuals in American history. *Thomas Paine: A Hero Scorned* included sculpture, prints, books, cartoons, and paintings relating to Paine's career as a political and social reformer both in America and abroad, and to the vicissitudes of his reputa-

tion in America and abroad. *U. S. Grant: The Man and the Image* commemorated the centennial of Grant's death and focussed on his role as soldier and president. It was jointly organized by James G. Barber of the gallery's staff and the Lyndon Baines Johnson presidential Library in Austin, Texas, to which it moved at the close of its Washington showing. Two additional one-gallery shows featured family portraits of famous nineteenth-century individuals and *Women on Time* appeared in the room devoted to *Time* cover originals.

Three exhibitions were distinguished not only by the private support they received and by the research of staff and guest curators, but also by honors received for their catalogues from the American Association of Museums. *Peace and Friendship: Indian Peace Medals* by Father Francis Paul Prucha won an Award of Distinction and *Miguel Covarrubias Caricatures* by Beverly J. Cox and Denna Jones Anderson, and *William Edward West, 1788-1857: Kentucky Painter*, by Estill Curtis Pennington each won an Award of Merit, as did the gallery's quarterly Calendar of Events.

In addition to the numerous exhibition related catalogues, the National Portrait Gallery descriptive brochure was revised. A favorable reader's report was received by the Yale University Press, which sets in place the publication of volume 2 of the *Selected papers of Charles Willson Peale and His Family*. This large volume—*Charles Willson Peale: The Artist as Museum Keeper, 1791-1810*, will be published in two parts.

All exhibitions of the National Portrait Gallery are accompanied by a diverse series of programs ranging from current Lunchtime Lectures to such major efforts as a symposium devoted to sports photography occasioned by the Conlon exhibition. The Education Department continues to provide in its acclaimed Portraits in Motion series portraiture in theater; as a complement to the gallery's Permanent Collection of Notable Americans, this year Eleanor Roosevelt, Frederick Douglass, Charles Ives, and Thomas Paine were among those celebrated. Gallery programs have also included lectures presented throughout the nation (and, in the spring, as far overseas as Tokyo, Japan) by staff members.

This past year the NPG purchased more than 100 works for the collection and received approximately 75 gifts. Notable painted portraits included Revolutionary War and War of 1812 officer William Hull by Gilbert Stuart, writer Dashiell Hammet and singer Lena Horne by Edward Biberman, and self-portraits of artists Frank Duveneck and Alice Neel. Major prints and other paper works include images of artists Thomas Hart Benton and John Stewart



Biserman

Curry, a multiple in cast paper by Chuck Close of composer Philip Glass, a Covarrubias caricature of collector Chester Dale, Ben Shahn's drawing of atomic physicist J. Robert Oppenheimer, as well as a rare broadside advertising a \$100,000 reward for John Wilkes Booth and his accomplices. Among the outstanding photographs acquired are the portraits of photographer Edward Steichen by Heinrich Kuhn, two portraits of Edward Everett by the Scottish photographers Hill and Adamson, a tintype of James Butler ("Wild Bill") Hickok, authors Tennessee Williams and S. J. Perelman by Irving Penn, composer Aaron Copland by George Platt Lynes, entertainer Gypsy Rose Lee by Ralph Steiner, and photographer Diane Arbus by Garry Winogrand.

The national survey of the Catalog of American Portraits—a research center within the National Portrait Gallery now in its seventh year—conducted field research in Texas, Oklahoma, and New Mexico, adding approximately 1,500 additional portrait records to the Catalog. In all, some 26,000 records will have been processed and entered into the computer by the end of fiscal year 1985, comprising a data base from which computer-generated printouts will have been sent to more than 275 portrait-owning institutions. In addition to responding to daily inquiries from museum professionals and the general public, the Catalog played an important role in securing materials for major studies of Raphaelle Peale, Henry Inman, Anders Zorn, and Frank Duveneck, and is assisting in the groundwork for an exhibition of American Portraiture from 1700–1776.

The Office of American Studies (OAMERS) continued its program in graduate education throughout the year. The 1984 fall semester seminar in "Material Aspects of American Civilization" had as its theme "Material Culture of the Future," and was taught by the director of the program and Professor Bernard Mergen of the George Washington University.

"The Decorative Arts in America," another seminar during the academic year 1984–85, was taught by Barbara G. Carson. Individual graduate students continued to pursue specialized research under the supervision of the director of the Office of American Studies.

MUSEUM PROGRAMS

William N. Richards, Acting Assistant Secretary for
Museum Programs

Conservation Analytical Laboratory

The Conservation Analytical Laboratory (CAL) engages in research in the conservation, technical study, and analysis of museum objects and related materials. Within these areas of expertise it provides advice and services to other bureaus. Conservation-related information is made available to museum professionals nationwide and to the general public. CAL plans and implements the activities of the Smithsonian conservation training program.

While the administrative structure of the laboratory consists of a number of departments—conservation, conservation science, archaeometry, and information—these groups are highly interrelated and mutually dependent. The increased emphasis on research activities, a trend strongly continued in this past year, reflects a change in CAL's role away from that of a basically service oriented organization. Great progress was made in implementing the new program initiatives in research and training.

The conservation staff was increased with four new conservators to a total of eleven. A visiting furniture conservator from the Netherlands worked at CAL for half a year.

The efforts of the conservators were focused on three general areas: conservation treatment, research, and training. Actual treatment of Smithsonian collection items is not a goal *per se*, but rather serves to focus attention on urgent problems in conservation which need further research, or to apply the results of research on the development of conservation technology in practice. Nonetheless, the efforts of the conservators constituted significant assistance to the various Smithsonian museums.

In addition to individual object-oriented projects, the conservators actively pursued more general research interests, such as the effects of removal of cellulose degradation products during water washing; the history and technology of coated papers; the study of early printing inks; the preservation problems of weighted silks; silver cyanide corrosion as a result of earlier treatment; the treatment of salt efflorescence on ceramic and stone objects; the material properties and the conservation of zinc sculpture; the conservation of leather objects; the suitability of commercial glazing stains for furniture conservation treatment; and the use of nitrocellulose lacquer as a contemporary finishing material. CAL conservators contributed a number of papers and presentations at various professional meetings.

A team of fifteen CAL conservators and scientists produced thorough documentation on the condition of the component wood, metal, and fabric parts of the Wright Brothers' Flyer, as well as chemical analyses of varnish and paint finishes and lubricants, in preparation for the restoration by NASM staff.

Assistance to other bureaus through the program for environmental monitoring of exhibition and storage areas continued. Preparation of the fumigation facility at the Museum Support Center progressed satisfactorily.

CAL staff introduced a number of new initiatives in conservation training. Five advanced conservation courses, taught by recognized experts, were organized: "Design and Operating Parameters of Suction Tables for Paper Conservation"; "Wood Identification"; "Polymer Chemistry"; "Molding and Casting of Museum Objects"; and "Glass Restoration." In addition, CAL cosponsored three courses organized by other institutions.

Training was also provided in the form of internships at various levels of professional advancement and experience. Four textile conservation interns worked at CAL during the summer. Two conservation students were selected for one year internships, to be served during the academic year 1985–86. Also selected was the first post-graduate conservation intern. This internship is meant to enable the recipient to engage in a research project as well as to build practical experience.

In addition, CAL staff participated in the provision of conservation information to other museum professionals, lecturing both within the Smithsonian and at other institutions.

The public conservation information program answered an average of twenty-five inquiries per week, an increasing number of which were received from conservation professionals from other institutions.

The staff in the conservation science group, which saw two new additions, was reorganized into three sections: inorganic chemistry, organic chemistry, and climate-related studies. The staff in these sections were involved in a wide variety of research projects and performed a large number of chemical or physical analyses and technical studies in support of Smithsonian conservators. Staff members reported on the results of their work through publications and a number of lectures and papers at professional meetings.

The scientists studied the effects of various fumigants on materials from which museum objects are composed; the composition and technology of historic wire used for stringing harpsichords; the composition of sequential layers of volcanic tephra from Costa Rica; an investigation of corrosion induced on metal objects by fatty acids introduced in earlier conservation treatments; characterization of jade sources used by the Mayas; compositional studies on French medieval sculptural limestones of the Paris and Burgundy regions; characterization of turquoise sources in the American Southwest; and the dimensional changes,

and consequent damage, in woodwind instruments as a result of changes in relative humidity during playing. Measurements were also made of firing conditions in a traditional Indian potter's kiln, erected at the Museum Support Center in connection with the Aditi Festival; these have direct applications in the interpretation of technological studies of archaeological ceramics. Research continued on the interaction of the architectural design and climate control in historic structures and other museum buildings. Special equipment, to produce a continuous record of heat and moisture transport through walls, was designed and is being installed within the new facade of the Renwick Gallery.

In the archaeometry program the work of laboratory studies of museum collection items and excavated artifacts to investigate problems in anthropology and art history resulted in many publications and papers presented at professional meetings.

Visiting CAL on a Fulbright Hays Research Fellowship, Maria Ligeza, from the Academy of Fine Arts in Krakow, Poland, studied the effects of gamma radiation on the oxidation of linseed oil, in conjunction with the program for neutron induced autoradiography.

Two areas for major concentration of long-term archaeological studies were identified: the American Southwest and the Middle East. One newly started project focuses on the social relationships among the Hopi tribes during the period A.D. 1300–1600 as these can be inferred from a compositional, technological, and stylistic analysis of yellow firing pottery, integrated with more traditional archaeological information.

A Scholarly Studies grant enabled the undertaking of a project titled "The Production and Distribution of Ceramics in Fourth and Third Millennia B.C. Middle Asia," an integrated typological, technological, and chemical examination of ceramics, to address socio-economic aspects of state development in the Indus Valley and the Helmand civilization.

The program of lead isotope analyses, in cooperation with the National Bureau of Standards, the Freer Gallery, and the Corning Museum of Glass, concentrated upon analyses of Chinese bronzes in the Sackler Collection, while analyses on a group of Chinese glasses from the collections of the Royal Ontario Museum and the Corning Museum of Glass were completed.

The Smithsonian Archaeometry Research Collections and Records (SARCAR) now contains about 22,000 analytical datasets of archaeological materials; the research capability of the database was enhanced through a new set of more interactive statistical facilities. An important sam-



Scientist David Erhardt inspects the port of the Conservation Analytical Laboratory's organic mass spectrometer, which became operational this year. This system is the only one in the United States completely dedicated to research related to museum objects.

ple and reference materials collection of archaeological metallurgical interest was donated to SARCAR.

Two postdoctoral fellows in Materials Analysis pursued projects at CAL during this year, on the raw materials used in the production of Central European Iron Age glass, and on a mineralogical, chemical, and technological study of the use of specular hematite as a pigment on Mesoamerican ceramics.

Research continued on the application of electromagnetically induced conductivity measurements for the prospection of archaeological sites in Bahrein, Kuwait, and Jordan. This research was carried out in close cooperation with the Department of Anthropology, National Museum of Natural History.

The National Museum Act (NMA), established by Congress in 1966, responded to continuing needs in the museum field through grants for researching museum-related problems, disseminating technical information, and training mid-career or beginning professionals. Conservation issues were again emphasized in each of the grant categories that were offered in 1985. The Advisory Council reviewed 185 proposals requesting \$3.2 million, and sixty-four awards were made totaling \$659,363. Of that number 64 percent concerned training and research in conservation.

Training grants for beginning professionals were made to academic institutions with museum-related courses, to museums with established internship programs, and to individuals pursuing graduate or advanced training in conservation both here and abroad. Internship programs, which enable individuals to gain valuable hands-on experience that cannot be acquired in an academic setting, involved art and history museums as well as a planetarium in the Midwest and major botanical gardens in New York, Massachusetts, and Missouri.

Seminars supported by NMA are designed primarily to reach professionals who are already employed by museums and who can profit from updated information on specialized topics. In 1985, several seminars were supported in various regions of the country to focus on conservation-awareness in small and medium-sized museums, and a regional conservation center in the Northwest brought together directors of small museums and conservators to discuss the visual effects of treatments for paintings.

Again this year, most of the awards for research projects involved issues associated with the conservation of museum collections. For example, scientists in North Carolina are studying the deterioration mechanisms of silk for the purpose of developing improved conservation treatments, and a researcher in Kentucky is investigating methods for identifying irreplaceable diacetate negatives in photographic collections so they can be treated or duplicated before rapid degeneration begins.

A special category of grants concerns technical services to the museum field that do not involve training or research. This year a museum-related organization in New York was funded to produce data sheets on health hazards in museum laboratories, a subject of increasing concern to practicing conservators, and a major art museum in Philadelphia received assistance in publishing the proceedings of an important conference on the conservation of outdoor sculptural monuments.

The projects performed by the Office of Exhibits Central (OEC) continue to reflect the diversity of interests and high degree of specialization as well as the truly unique aspects of museum exhibitions required by the Smithsonian. OEC completed a life-size model of the jaw of the *Carcharodon megalodon*, a prehistoric shark, in mid-September. The model, the only one of its type, required almost three years of development and will be installed in the Dinosaur Hall in the National Museum of Natural History, where it will remain on exhibit indefinitely.

About six feet in height, the open jaw contains 265 teeth—48 original fossils and 217 reproductions. Because there are no fossil remains of the jaw itself, senior OEC model maker Walter Hock worked from the calculations of scientists at the National Museum of Natural History and the American Museum of Natural History to sculpt three life-size models of the jaw in plastilene, a reusable synthetic clay. The 217 teeth were cast in epoxy over several months, and at least six student interns worked on sanding, detailing, and painting the models under the supervision of OEC staff as part of their training. After the scientists gave final approval of the size and configuration of the jaw, a team of model makers joined Walter Hock to produce the exhibit model in fiberglass. This project—a once-in-a-career experience for the model makers—produced an object that will be part of the permanent collections.

The Fabrication Unit of the OEC—which includes the cabinet shop, paint shop, and sheet plastics shop—constructed and supervised the installation of two groups of custom exhibition cases for the Cooper-Hewitt Museum. These cases were designed to fit the unique architectural detailing of the Cooper-Hewitt galleries. The cases also required specialized security and conservation features and the subcontracting of certain glass, metal, and electrical components, all of which were delivered to New York and assembled on-site—a planning and logistical exercise involving several SI units.

The Fabrication Unit also produced over 180 custom shipping containers to ship museum objects and exhibition components for the Smithsonian Institution Traveling Exhibition Service (SITES). Sixty-five of these containers were for one exhibition: *Ebla to Damascus: The Archaeology of Ancient Syria*, the largest and most complex project performed at OEC this year. This SITES exhibition opened at the Walters Gallery in Baltimore in early September 1985 and will be shown at only five other museums in the United States—ending at the Evans Gallery of the NMNH—before being returned to Syria. Exhibition planning began in 1984, and the actual work, which at some

point involved every OEC unit, began in April 1985. The exhibition was designed by Mary Dillon and written and edited by Rosemary Regan, OEC specialist with experience in large exhibition projects requiring coordination with scholars outside the Institution and teamwork within OEC. Ms. Regan worked with information provided by four academic consultants to prepare the texts and labels that identify and interpret—and interrelate in a consistent style—281 objects covering 10,000 years of history. Ms. Dillon devised a system of graphics panels, using maps and time lines to relate time, place, and objects throughout the exhibition. In addition to the objects, which range in size from a cylinder seal 1/2-inch long to a stone “cult basin” weighing 1600 pounds, 68 panels of photographs, drawings, maps, and texts travel with this presentation.

OEC specialists typeset and proofread all of the typography for *Ebla to Damascus*, prepared all of the maps and diagrams, silkscreened labels and illustrations, and mounted the photographs. Working with SITES coordinator Anne Gossett and SITES Registrar Mary Jane Clark, and with conservators and other museum specialists, the OEC Model Shop produced brackets and handling devices for most of the objects—including a very innovative fiberglass “jacket” to protect and display two delicate frescoes. Model makers and fabrication specialists worked in teams to modify approximately fifteen of the shipping crates in which the heavier objects were delivered from overseas to assure safety and ease of handling for the U.S. tour.

The *Ebla* exhibition was a major project for the OEC in fiscal year 1985, and it will be a major museum event in each of the six cities where it will be presented. A project of this scope also illustrates the variety of skills practiced at OEC and demonstrates the manner in which coordinated scheduling of separate tasks in OEC offices and shops results in what is perceived as a single presentation. Every OEC staff member does not work on the same project at the same time, however, and more than two hundred separate projects were completed this year—a yearly norm for the OEC. In addition to *Ebla*, twenty other new SITES exhibitions were completed at OEC this year on schedule for museum openings in all parts of the United States. Exhibition-related projects included designing, writing, editing, and supervising the printing of over seventy brochures for the travel programs of the SI Associates, the production and silkscreening of 123 graphics panels for the Festival of American Folklife, and a series of small panels installed in four SI buildings to recognize the twentieth anniversary of the Smithsonian Resident Associates.

OEC staff conducted a three-day on-site workshop on exhibition techniques for the Minnesota Historical Society, served as faculty for professional workshops in Washington, and provided in-shop training and graduate internships. Other highlights of the OEC year include producing exacting models of owl eggs for the Education Department of the National Zoological Park, making a life mask of astronaut Senator Jake Garn for the National Air and Space Museum, and guiding and supporting the Washington Craft Show sponsored by the Women’s Committee of the Smithsonian Associates. The OEC year began with the completion of last year’s major project: OEC and SITES staff returned the exhibition *Treasures from the Smithsonian Institution* from Edinburgh. More than 250 objects were safely returned to the thirteen Smithsonian museums that participated in that project.

It has been more than a year since the administrative, editorial, and typesetting offices joined the rest of the OEC staff at the Smithsonian Institution Service Center (SISC) at 1111 North Capitol Street, and the advantages of the entire staff working under one roof have become increasingly apparent. Coordination between designers, editors, and shop supervisors is smoother than ever before. A new, consolidated Administrative Unit has been established, and other organizational changes have been developed to strengthen management of OEC resources.

Office of Horticulture

During its thirteenth year, the Office of Horticulture continued to provide a full range of horticultural services to the bureaus as well as educational programs for Associate Members and the general public. An office memorandum and related policies were developed, and an administrative officer, a librarian, and museum specialist joined the staff. Volunteers and interns made it possible to complete several special projects.

The office provided almost 14,000 tropical, seasonal, and collection plants and 102 floral arrangements for over 500 Smithsonian special events, a twenty-five percent increase over 1984. In addition, fifteen trees, 1,100 poinsettias, evergreen wreaths, and garlands were displayed during the Christmas season.

The eighth annual *Trees of Christmas* exhibition contained twelve new collections of ornaments. Dixie Rettig, an office volunteer, assisted Lauranne Nash in coordinating the exhibition, presented in the National Museum of American History, from December 4, 1984 through January 6, 1985. Over 275 volunteers created the 2,868 ornaments, which were donated for future exhibitions. Volunteers Barbara Restum, Jane Cronin, and Bonnie Hooker assisted with the installation.

The Accessioning and Records System for living plant collections now prints accession cards within one week from the date of entry. Data on over 12,000 accessioned plants have been edited.

To refine the permanent collection at the greenhouse and prepare for the opening of the Quadrangle Project, 25,402 orchids and 232 bromeliads were repotted. Orchid displays were installed in the National Capital Orchid Society and Maryland Orchid Society shows. Although noncompetitive, the office was recognized by a letter of appreciation and a first-place award. These exhibitions often attract such donations as the 260 specimen orchid plants and 35 assorted tropicals from Mrs. Victor Alfaro.

Greenhouse improvements included installation of a cooling system in two greenhouses to increase the survival rate of rare species orchids, an underground irrigation system in the nursery area less subject to freezes, and a woven polyethylene weed barrier in the cutting garden.

Plant displays were renovated in permanent galleries at the Freer Gallery of Art, Museum of American Art, and Woodrow Wilson International Center for Scholars. Historic and educational plants were specially grown for *Mammals in the Limelight*, *Aditi—A Celebration of Life*, and the *Arts of South Asia*.

The Grounds Management Division planted in Mall environs 75,452 flowering annuals and 16,000 pansies, produced by the Greenhouse Nursery Division, and

50,000 spring bulbs. Other grounds improvements included three new flower beds at the National Museum of American History; the perennial border at the National Museum of Natural History; new sod, cafe planters, and ten Zelkova trees for the National Air and Space Museum; and four new planters on the Hirshhorn Museum and Sculpture Garden plaza. Brass labels were attached to permanent plantings.

Susan Gurney became the librarian for the horticultural library collection of approximately 2,000 bound volumes, 15,000 trade catalogs, and 180 serial titles. Nineteen volumes donated by Ikebana International Inc., Washington, D.C., Chapter No. 1, are excellent references for the Quadrangle Project.

Requests for assistance with research, publications, exhibitions, lectures, and tours have increased. In 1985, twenty-eight groups toured the plant collections. Visitors included Supreme Court Justice Sandra Day O'Connor and her staff; Mrs. Bajpai, wife of the Ambassador of India; The American Association of University Presidents' Partners; and members of the Center for Plant Conservation. In association with the Smithsonian Resident Associate Program, fall and spring tours of the greenhouse and a special program on historic holiday decorations were arranged. All Smithsonian staff and volunteers were invited to an open house on May 19, 1985 at the greenhouse complex.

The purchase of a 35-millimeter slide storage cabinet was made possible by a gift from the Women's Committee of the Smithsonian Associates. Slides depicting various horticultural subjects were loaned to the U.S. National Arboretum, Kennedy Center, Northern Virginia Regional Parks, Cooper-Hewitt Museum, Office of Public Affairs, and others. Nineteen illustrations from the collection were selected by the Smithsonian Business Management Office for the *Smithsonian Engagement Calendar 1986*.

Director James R. Buckler delivered the following lectures: "Frolicking in the Garden," on nineteenth-century garden pastimes, at the Margaret Strong Museum in Rochester, New York; and "Shinnecock Hills: An Art Colony in a Garden," depicting late nineteenth-century landscape development on Long Island, at the Amon Carter Museum of Western Art in Fort Worth, Texas.

Sally Tomlinson has continued to work regularly as a volunteer, assisting in the management of the artifact collections.

James Buckler served on the Board of Directors of the National Colonial Farm, the Kentucky Botanical Gardens, the Horticultural Advisory Board of Grey Towers, and Friends of Rockwood Museum.

Office of Museum Programs

August A. Dietz IV, manager of the greenhouse-nursery complex, served on the Board of Directors of the Azalea Society of America.

Lauranne Nash served as cochairperson of the Smithsonian Institution Internship Council during most of fiscal year 1985.

Seven interns were selected to participate in the horticultural program during 1985. A curriculum was designed for individual interns to maximize their educational background and special interests.

Plant production for the Quadrangle Project is underway and testing for light requirements is being conducted. Major trees for the Enid A. Haupt Garden have been selected and the garden furnishings are undergoing restoration.

The office's garden furnishings collection, which includes many labeled pieces, was featured in an article in the *Washington Post*. Twenty-four pieces were loaned to the Historical Society of Talbot County for their major exhibition *The Art of Gardening—Maryland Landscapes and the American Garden Aesthetic, 1730–1930*. James Buckler and Kathryn Meehan coauthored an essay on nineteenth-century American horticulture for the exhibition catalogue.

The public displays of living plant collections and horticultural artifacts—the Fragrant Garden, the north foyer of the National Museum of Natural History, the rotunda of the Arts and Industries Building, and “A Victorian Horticultural Extravaganza”—continue to delight visitors. For the fourth year volunteers Dorothy High and Bruce Buntin rotated and groomed the many rare and unusual plants in the “Horticultural Extravaganza.”

At the request of the Smithsonian Institution Visitor Information Center a plan for easier visitor access into the Smithsonian Institution Building from the north side is being developed. A palm court concept has been drafted for the South Tower Room, to open into the Haupt Garden.

The office completed a preliminary plan for a new Educational/Research Center at the United States Soldiers' and Airmen's Home. This new Center would combine the current facilities with new educational, research, and storage space to accommodate the growth of the Office of Horticulture. The office plans to solicit gifts to support this long-range project.

The Office of Museum Programs (OMP), directed by Jane R. Glaser, provides a variety of training, information, and advisory services for the professional development of museum personnel and their institutions throughout the United States and abroad.

The training program, coordinated by Mary Lynn Perry, sponsors an annual schedule of twenty-five to thirty intensive short-term workshops on current museum practices which provide mid-career training opportunities for museum professionals. Faculty for the workshops are drawn primarily from the Institution's staff; the subject matter presented covers a broad range of topics on museum operations.

During 1985, over 430 museum professionals enrolled in the workshop series; participants came from all types and sizes of museums in forty-two states and the District of Columbia, and from ten foreign countries. New subjects presented in 1985 were “Management of Volunteer Programs,” “The Museum as a Learning Resource,” “Horticulture for Zoos: Habitat and Environment,” “Computers in Collections Management and Research,” “Integrated Pest Management for Museums,” and “Developing and Managing Effective Internship Programs.”

A national survey to assess museum training needs in the U.S. was conducted during the year; the results are being analyzed for future workshop planning.

Similar training services are offered to museum professionals at locations throughout the United States and abroad in cooperation and cosponsorship with local host museums and museum-related organizations. Eight on-site workshops attended by 187 museum professionals from sixteen states and two foreign countries were presented. Cosponsors included the Virginia Association of Museums, the Minnesota Historical Society, and the New York Regional Conference of Historical Agencies.

By invitation from the Ministry of Culture of Pakistan and with support from Smithsonian Foreign Currency funds, two three-day workshops entitled “Preventive Care of Collections” were conducted in Islamabad and Karachi. Fifty persons from museums and archives in Lahore, Peshawar, Hyderabad, and Moenjodaro, as well as from Islamabad and Karachi, were enthusiastic and responsive participants, all of whom regarded the workshops as very productive and beneficial.

The Internships in Museum Practices Program, coordinated by Raymond Branham and Bruce C. Craig, arranges for students and museum professionals to be placed in Smithsonian museums and offices for training in collections management, exhibit design and production, registration, curatorial, and other museum practices. In 1985,

seventy-five persons from the United States and abroad took part in the program while another twenty-seven interns participated in the third annual OMP Museum Careers Seminar Series.

The Visiting Professionals Program schedules short-term visits (one-month or less) for museum professionals to meet with Smithsonian staff for concentrated discussion and consultation and to examine collections. Visits are designed to fulfill the requests and meet specific needs of the participants. Thirty-seven visitors from museums in the U.S. and eighty-six from museums and related organizations in Africa, Asia, Europe, and Central and South America took part in these activities.

Since 1983, OMP has joined with the Multicultural Bilingual High School in Washington, D.C., to offer internships in a variety of operational and program areas of the Smithsonian to high school students. Positive evaluations from students and supervisors alike have encouraged the continuation of this program. Twenty-six students were involved in 1985.

The Audiovisual Program, coordinated by Laura T. Schneider, produces and distributes slide/cassette productions and videotapes on subjects of interest to the museum profession. Emphasizing care of collections, the topics also include museum interpretation, the visitor, museum careers, security, historic preservation, and folklife. Printed materials supplement the audiovisual presentations. Programs placed in distribution during 1985 included a slide/cassette program, *Photographic Negatives in the Juley Collection: Their Care and Preservation*, and a videotape, *Outdoor Sculpture: Preserving the Hirshhorn Museum's Collection*. In 1985, 139 slide programs and 186 videotapes were loaned to museums, institutions, and individuals; seventy-five programs were purchased by users wishing to have them available for convenient reference. Two productions received awards: *Tribal Archives*, a slide/cassette program, received a Gold Screen Award from the National Association of Government Communicators, and the videotape *Museum Accessibility for the Visually Impaired Visitor* was given a Merit Award by Superfest '85, a media festival for programs on disabilities.

The Native American Museums Program (NAMP), under the direction of Nancy J. Fuller, was very active in 1985. It established residencies at the Smithsonian for eleven Indian museum professionals, developed a new resource list, *American Indian Collections In European Museums and Archives*, published *The Proceedings of the 1983 NAMP National Workshop for Tribal Museum Directors and Administrators*, and compiled fifty reference packets on museum operations, legislation, and career

development in response to inquiries from twenty-five states, Canada, New Zealand, and Australia. The program continued to distribute its NAMP newsletter to a mailing list of more than 1,000. Planning for collaborative projects was also begun with the British Columbia Museums Association, the Burke and Makah Museums, and with the National Archives.

The Kellogg Project, supported by a grant from the W. K. Kellogg Foundation to "expand the educational role of museums," emphasized the development of the demonstration programs at its twelve "full participation" museums and organized workshops and seminars in San Antonio; the Bronx; San Francisco; Tahlequah, Oklahoma; and Washington, D.C. Two sessions of professional residencies held in 1985 brought fourteen senior museum education professionals to the Smithsonian. During ten-day study periods, the residents met with Smithsonian staff and area professionals to exchange ideas on a variety of issues affecting museum education. A three-year extension of the Kellogg Project is anticipated for fiscal years 1986, 1987, and 1988 with a major emphasis on evaluation and dissemination of information obtained during prior activities. All aspects of this program are coordinated by Phillip Spiess II.

The Museum Reference Center, a branch of the Smithsonian Institution Libraries specializing in museological subjects, answered over 1,500 inquiries from museum professionals, researchers, and students in the United States and thirty-six foreign countries. Over 600 persons visited the Center to make use of its comprehensive and specialized collections. The Librarian, Catherine Scott, contributed to the "Library Shelf List" of the *Museum Studies Journal* and also to the *Dictionarium Museologicum*, a UNESCO/ICOM publishing project, in preparation for the fifth edition. The Center published seventeen new bibliographies on museum subjects, bringing the total to sixty, and three quarterly issues of *Muse World*, a bulletin advising on recent publications of interest to museums.

Since 1979, OMP and the United States Information Agency (USIA) have cosponsored a project, "Education in Museums," which makes it possible for foreign museum professionals to visit the United States to study educational programming in museums here. The success of this project led to expansion of the subject matter in 1982 to include "Museum Administration" and "Collections: Management, Preventive Care, and Conservation Awareness" in 1985. In 1985, this last-named program involved thirteen participants from Bahrain, Columbia, Egypt, Fiji, Indonesia, Jordan, Kuwait, Mexico, Nepal, Pakistan, United Kingdom, Jerusalem, and Yap. The group toured museums in six major cities in the United States and discussed

practices and problems of collections management and conservation with American colleagues. OMP has now been requested by USIA to develop and coordinate a fourth project (museum management for Spanish-speaking museum professionals) for 1986.

Primary responsibilities of the Office of the Registrar involve reviewing collections management policies developed by Smithsonian museums and monitoring compliance with those policies. The Office is also concerned with procedures used for accessioning, cataloguing, and deaccessioning objects and specimens in the collections and with the inventory processes in the museums. For most of 1985, during a lengthy nationwide recruiting program made necessary by the retirement of the former Director of the Office, Mr. Philip Leslie, many of these responsibilities were assumed by the Office of the Assistant Secretary for Museum Programs. Basic documents governing the general policies which serve to guide activities in all collecting bureaus of the Institution were revised and reissued and the inventory process was monitored through periodic communication with responsible parties in each of the museums.

Smithsonian Institution Archives

The Smithsonian Institution Archives (SIA) is responsible for physical care of and intellectual access to records and proceedings of the Smithsonian. These, and donated papers of curators and scientific staff, and records of professional societies, are valuable sources for scholarly research in history, science, art, and the humanities.

A highlight of 1985 was receipt of archives of the National Museum of American Art, including official records of the old National Collection of Fine Arts, some from the late nineteenth century. Their acquisition is a major extension of the archival program into the art museums.

Two new guides to collections were published. William R. Massa, Jr., was author of the *Guide to the Charles D. Walcott Collection* and William E. Cox produced the *Guide to the Papers of Charles P. Alexander*. In 1985, the Archives prepared its first archival exhibition, the *Smithsonian—Roosevelt African Expedition, 1909–1910*, from materials in papers of Edmund E. Heller, who accompanied Roosevelt to collect specimens for the Smithsonian. A second exhibition, *Notable Smithsonian Women*, honors early figures such as Mary Jane Rathbun, Mary Vaux Walcott, and Lucile Quarry Mann. All future exhibitions will draw on the Archives' collections.

Basic Archival Program

During fiscal year 1985 the Archives continued to appraise records of the Institution and to select and care for those of permanent historic value. Records were surveyed at the Smithsonian Tropical Research Institute (STRI) and the Registrar's Office at the National Zoological Park (NZP). In the National Museum of Natural History (NMNH), surveys were completed in the Security Office, Department of Paleobiology, and Department of Vertebrate Zoology. Survey work at the Anacostia Neighborhood Museum began in the Office of the Director and was completed in several offices of the Freer Gallery of Art. At the National Museum of American Art (NMAA), surveys were completed in the Office of the Registrar and begun in the Curatorial Department.

In central administrative offices, surveys were completed in the Office of Museum Programs and the Office of the Director of Facilities Services. Disposition schedules were established for records of the Office of Plant Services.

Discovered in the Museum of Natural History and brought into the Archives was an album of photographs of nineteenth-century naturalists, the J. Victor Carus album, including images of Charles Darwin, Louis Agassiz, and

Thomas Henry Huxley. Among manuscript collections accessioned this year were papers of Bruce C. Heezen, Robert Silberglied, S. Stillman Berry, Thomas Soderstrom, and Porter M. Kier. Two professional societies joined a growing number that have named SIA as official repository for their records; accessions were received this year from the Animal Behavior Society and the American Society of Zoologists.

During the year the Archives loaned materials for several exhibitions, including one organized by the Joseph and Margaret Muscarelle Museum of Art at the College of William and Mary entitled *Modernism in America: 1937–1941: Four Architectural Competitions*. It includes drawings submitted for the 1939 Smithsonian Gallery of Art competition. Also loaned this year was a notebook of Constantine S. Rafinesque, as part of an exhibition held at the Lafayette Natural History Museum in Louisiana to commemorate the birth of John James Audubon. The Archives also contributed several items to accompany the loan of a Miss Japan Doll from NMNH for an exhibition in Japan about women and the Second World War. Architectural drawings from SIA of the Natural History Building were displayed in the NMNH 75th anniversary celebration.

Programs and Projects

The on-line library and archives catalogues of the Smithsonian Institution Bibliographic Information System (SIBIS) became available in the Archives in 1985, and work continues to prepare the archives catalogue for use throughout the Institution. SIA hosted a meeting of Washington, D.C., archivists on the topic of SIBIS. Archives volunteer Mary D'Imperio completed a user's manual for the on-line catalogues. Austin Moller, an intern from Portland State University, and Donna Webber, an intern from the Massachusetts Institute of Technology, studied and reported on various aspects of SIBIS, adding to the working knowledge of the system.

Other interns during the year included Dan Steven Sherburne, also from Portland State, who processed the C. Lewis Gazin Papers, and Catherine McGeehan, from George Washington University, who worked on the Col-

The Smithsonian-Roosevelt African Expedition of 1909–1910 was the subject of an exhibition in the Smithsonian Archives. Theodore Roosevelt and his son Kermit are shown here proudly surveying a Cape Buffalo destined for the United States National Museum.



lected Letters on Ethnology and the papers of Ernest P. Walker. Margaret Stevens, intern from the University of Virginia, is assisting with the SIA photograph survey project.

The photograph survey project continued surveying and describing the photographic holdings of the Smithsonian. During the year the staff located almost two million photographs in 518 collections in the National Museum of American History and the Cooper-Hewitt Museum. Reports were written to aid collection management and research access. Each collection is described in a survey report on the provenance, title, size, subject contents, physical condition, arrangement, processes and photographers represented, and usage policies. This serves as a basic guide for staff and researchers. Nearly two thousand pages of survey descriptions have been produced, supplemented by summaries to the bureau directors on the collections.

Oral History

Oral history interviewing with Smithsonian luminaries continued in 1985. Interviews completed and transcribed during the year brought the collection total to some two hundred fifty hours of recording accompanied by some forty-five hundred pages of typewritten transcript. The G. Arthur Cooper, T. Dale Stewart, Fred L. Whipple, A. Gilbert Wright, and Association of Curators interviews became available for research use. A 16-mm film of the Smithsonian Institution-Firestone Expedition to Liberia in 1940 was transferred to videotape, and a taped narration was synchronized to the visual images. A Seidell grant was obtained to further this work.

Lectures and Conferences

The Archives lecture series ended its second year of presentations on a range of topics from architecture to anthropology. USGS scientist Ellis L. Yochelson began the series with a talk on "Seventy-five Years of the Natural History Building." Succeeding lectures concerned the National Museum, John Xantus, and the history of geologic mapping in England. Ales Hrdlicka was the topic of the final lectures of the year, presented by T. Dale Stewart and Michael Blakey.

Reference Service

During the year more than two thousand reference inquiries were received, a substantial increase over last year. A number of publications based on research done at SIA were produced. Among these were Robert W. Rydell, *All the World's A Fair: Visions of Empire at American International Expositions, 1876-1916* (Chicago: University of Chicago Press, 1985); Ann H. Zwinger, "A Hungarian in Baja," in *Audubon* 87 (1985); and Arthur P. Molella, "At the Edge of Science: Joseph Henry, 'Visionary Theorizers,' and the Smithsonian Institution," in *Annals of Science* 41 (1984).

Smithsonian Institution Libraries

Smithsonian Institution Libraries (SIL) continued to serve the Institution and public through: (1) support of Smithsonian research, curatorial, and other program activities; (2) direct participation in creation of the national bibliographic data base; and (3) programs for publications, exhibitions, loan, and information services. The SIL is a member of the Association of Research Libraries and is organized on the model common in major North American universities. The Libraries is divided into three operational divisions: Automated Systems, Collections Management, and Research Services and has a centralized Planning and Administration Office.

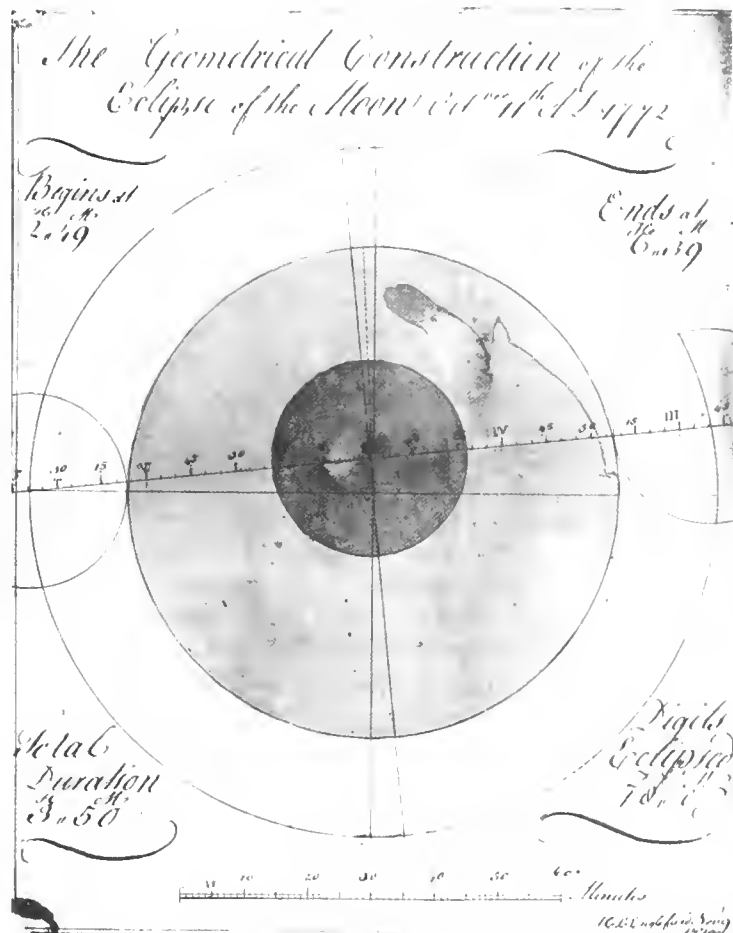
The SIL collections of approximately 980,000 volumes, including over 20,000 serial subscriptions, are available to Smithsonian and other scholars through a system of fourteen branch libraries spread over thirty-five locations throughout the Washington, D.C., area and in New York City, Cambridge, Massachusetts, and the Republic of Panama. The most recent branch library opened in fiscal year 1985 at the Office of Horticulture.

The SIL budgets represent two percent of all Smithsonian expenditures, federal and trust, exclusive of auxiliary enterprises. During fiscal year 1985, the Libraries received three grants from the Atherton Seidell Endowment Fund; the SIL was also awarded additional money to enhance research support and purchase additional materials. Personnel resources of the SIL were reinforced through the dedicated service of seventy-three volunteers who assist in all units of the Libraries.

During the past year, three reports by consultants describing critical issues facing the Libraries were completed: a conceptual study on library planning and spaces, a collections preservation report, and a security management survey. These studies address matters of importance to future operations of the Libraries: staffing, security, collections funding, and deteriorating collections, and each study presents concrete recommendations. Other planning this year included consultation with an architectural firm on SIL's immediate need for rental space so as to move and preserve collections which are badly housed.

Automated Systems Division

Sophisticated electronic technologies continue to be fundamental to SIL operations and planning in information transfer and resource sharing. The Libraries' on-line catalogue has, in its first full year of operation, become the main key to SIL holdings. It has been well received by users, and its rapid-search capabilities have important



Sir Henry Englefield's drawing of a lunar eclipse (1770), a manuscript from the Dibner Library in the History of Science and Technology of the Smithsonian Institution Libraries, is listed in *Manuscripts of the Dibner Collection*, published by the Smithsonian Institution Libraries in 1985.

advantages to researchers. Currently containing over 260,000 records with new cataloguing being added daily, SIL's on-line catalogue can be accessed from more than eighty SIL terminals as well as others located across the Institution, and by dial-in via computer-telecommunication links. The automated Acquisitions subsystem which requests books and journals on line and communicates all acquisitions financial data to the Institution's accounting office became operational this year. SIL, collaborating with Geac, the manufacturer of SIL's automated library system, is developing a sophisticated system with features designed for use by both the French Bibliothèque Nationale and the Smithsonian Institution. Several enhanced capabilities and broadened functions are being planned and tested in this cooperative project. Using Online Computer Library Center (OCLC), SIL continues

its conversion of catalogue cards into machine readable on-line records. This year a significant number of natural history records were converted and the former Bureau of American Ethnology (BAE) library records are now being upgraded and changed into machine-readable format. When completed, it will be possible to merge all SIL anthropology materials into one sequence.

Collections Management Division

The Acquisitions unit was transferred from the Automated Systems Division to the Collections Management Division in May, thereby consolidating the management functions of selecting, purchasing, and exchanging publications with those of binding, book restoration, and preservation of the collections. This unit acts as the purchasing agent for all library materials and all books purchased for the Institution. In June the Libraries launched a Preservation Planning Program, supported by the Association of Research Libraries, which will produce documentary evidence of the physical condition of the collections and recommendations for new preservation policies and programs.

The African Art Branch Library, scheduled to open in the Quadrangle, received an increased acquisitions budget to purchase monographs and serial titles as well as rare items relating to Africa. The Special Collections Branch Library added thirty items, including works on the history of museums and of collecting, and of scientific instrumentation. Several bequests during fiscal year 1985 added depth to the fields of chemistry and metals analysis, physical anthropology, and ceramics and glass.

Research Services Division

The fourteen branch libraries of this division provide reference support to Smithsonian curators and other staff as well as to a broad range of users from outside the Institution. Assisted by an expanded range of bibliographic tools, the division was able to offer more prompt and reliable service this year in its reference support to users. The SIL on-line catalogue was used extensively in all branch libraries, more SIL staff was trained to search commercial on-line data bases such as DIALOG and NEXIS, and telefacsimile equipment has now been installed in four branches. Despite the handicap of limited collections which forces the SIL to go to outside services for forty percent of requests, the reference staffs logged a remarkable record of answering an average 619 reference questions a

day. To serve research needs which cannot be met from its own holdings, SIL borrowed 17,342 volumes this year. A study conducted with grant funds demonstrated unequivocally that commercial document delivery services could provide a significantly larger fill rate and an improved turn-around-time compared to traditional interlibrary loan methods.

Planning and Administration Office

A major renovation project begun this year will strengthen the Natural History Branch Library and clarify the functions and operations of that branch library and that of the Libraries' Central Reference and Loan Services (CRLS). CRLS, which was the focus of this year's renovation efforts, will house a modern reference operation when completed, with an emphasis on on-line data base searching and document delivery.

Public Programs

Outreach activities this year included an Open House to introduce the new SIL Automated Library System to representatives of units throughout the Institution. The SIL hosted several meetings, including a national meeting for Geac users from fifty major libraries, a planning meeting for developing an authority control system for SIL's Automated Library System, a meeting of the Washington Book Conservators, and a visit from a Smithsonian Associates tour group. As part of the Institution's Festival of India celebration, the SIL presented *Panorama of India: An Exhibition of Books, Prints and Manuscripts*, dating from 1698 to 1898, which was accompanied by an illustrated brochure. Other exhibitions held in the Dibner Library this year were *European Roots of American Pharmacy* and *Recent Acquisitions in SIL*. SIL produced two new volumes in its Research Guide Series: *African Art: A Bibliographic Guide* by Janet L. Stanley, and *Manuscripts of the Dibner Collection*. The latter is an illustrated volume listing 1,614 manuscripts in the history of western science and technology from the Middle Ages to the present which are available to users in the Dibner Library of the Special Collections Branch Library. The SIL, funded by the Smithsonian Foreign Currency Program (SFCP), administers its Translation Publishing Program which has made available 196 significant scientific and cultural works to libraries and scholars around the world since the program began in 1959. In March 1985 thirty-five proposals for translated

Smithsonian Institution Traveling Exhibition Service

publications were received from twenty-three departments of the Institution and evaluated and ranked by a Review Committee composed of representatives from four of the Institution's museums. In August the Libraries received a further SFCP grant of \$300,000, supplementing a grant of the same amount awarded the previous year. The SIL's participation in a number of international projects this year included cooperating in the production of the *Dictionary Museologicum*, a multilingual glossary of 2,066 museum-related terms which is being jointly sponsored by UNESCO and the International Council of Museums. Director Maloy assembled a group of distinguished museologists in June to serve as the Ad Hoc American Review Committee for this proposed publication which is scheduled to be published in 1986. Silvio A. Bedini delivered a paper at an international conference which he helped to organize at the University of Rome on the history of museums. An Israeli librarian began a year's internship in the Book Conservation Laboratory and an SIL librarian went abroad to work in a Paris library while his Fulbright exchange partner came to the SIL from France and spent nine months rotating through five units of the Libraries. Visitors to the SIL included three groups of librarians from countries around the world who came to observe SIL operations.

Ebla to Damascus: Art and Archaeology of Ancient Syria, an exhibition of 281 objects that span 10,000 years of history, began its tour in September 1985 at the Walters Art Gallery in Baltimore, Maryland. Organized by the Smithsonian Institution Traveling Exhibition Service (SITES) and the Directorate-General of Antiquities, Syrian Arab Republic, the exhibition marks the first time that antiquities from Syria have been shown in North America. Financial support for the exhibition was provided by an anonymous sponsor, the Arabian American Oil Company (Aramco), Shell Oil Companies Foundation, Inc., and Mobil Oil Corporation. SITES received an indemnity from the Federal Council on the Arts and Humanities for the loan objects. The J. Paul Getty Trust provided funding support for SITES' publication of the major exhibition catalogue. SITES also published a full-color poster, five color postcards, and an interpretive booklet.

In addition to *Ebla to Damascus*, another major international exhibition that began its tour in 1985 was *Three Centuries of German Painting and Drawing from the Collections of the Wallraf-Richartz Museum, Cologne*. This exhibition opened in September at the Indianapolis Museum of Art with a full complement of representatives from the Federal Republic of Germany and the Wallraf-Richartz Museum. The exhibition of ninety-two works is supplemented by a fully-illustrated catalogue and full-color poster, both published by SITES. Other international exhibitions included *Power and Gold: Jewelry from Indonesia, Malaysia and the Philippines*, *Peonies of Greece: Myth, Science and Art*, and *Mouton Rothschild: Paintings for the Labels*.

A total of twenty-four new exhibitions began tours in fiscal year 1985, and a large percentage of these were developed with Smithsonian bureaus. *Exploring Microspace* and *Beauties of the Coral Reef* were organized with the National Museum of Natural History. From the collections of the Hirshhorn Museum and Sculpture Garden, and in collaboration with curator Frank Gettings, SITES organized *Artists and Models* and *Genre Scenes*. Gallery brochures were published for both of these exhibitions. From the National Portrait Gallery, SITES is circulating *Baseball Immortals: The Photographs of Charles Martin Conlon, 1905-1935*, *Mathew Brady Photographs from the National Portrait Gallery's Meserve Collection*, and *Athletes and Heroes: Portraits from the Time Collection at the National Portrait Gallery*. *America's Space Truck* proved to be such a popular exhibition that a second version was introduced this year, again prepared with the National Air and Space Museum. *The Laser at 25* was organized with the National Museum of American History. *New Vistas:*

American Art Pottery 1880–1930 from the Cooper-Hewitt Collections and *Sharing Traditions: Five Black Artists in 19th Century America from the Collections of the National Museum of American Art* began their national tours in 1985. Two major decorative arts exhibitions began their tours at the Renwick Gallery: *Newcomb Pottery: An Enterprise for Southern Women, 1895–1940*, organized with Newcomb College of Tulane University, and *Material Evidence: New Color Techniques in Handmade Furniture*, organized with Formica Corporation and The Gallery at Workbench.

Among the more innovative exhibitions for 1985 was *The Laser at 25*, which included participatory displays as well as educational materials that approach new technology head-on. A SITES-developed educational computer software program on light and laser light will accompany the exhibition. A longer, computer assisted instructional program will be developed for home and school markets. A hands-on gallery kit, guidelines for teacher orientation, and other assistance help bring the exhibition alive for nonscientific audiences while reinforcing its themes. The exhibition was produced with the cooperation of the Institute of Electrical and Electronics Engineers and the Optical Society of America.

SITES continued to arrange for foreign showings of exhibitions. *Spectacular Vernacular* and *Galapagos: Born of the Sea* traveled to Australia; *Good as Gold: Alternative Materials in American Jewelry* was circulated to five countries in South America by the U.S. Information Agency; *America's Space Truck* was shown in Peru; *A Cartoon History of U.S. Foreign Policy* was viewed in Spain; *Music and Dance in Papua New Guinea* and *An Age of Gold: Three Centuries of Paintings from Old Ecuador* were shown in Haiti; and fourteen exhibitions were booked by museums and institutions in Canada.

Preparations for the May 1986 opening of *Hollywood: Legend and Reality* began this year with a June 1985 press conference that received wide media coverage. Among other major exhibitions planned for 1986–87 are *The Paris Style 1900: Art Nouveau Bing, Gauguin and His Circle in Brittany—The Prints, Surrealist Art from the Hirshhorn Museum and Sculpture Garden*, and *Artificial Reefs: Expanding on Nature's Ideas*.

A monumental project for fiscal year 1986 will be the planning and organization of the inaugural exhibition for the International Gallery. Entitled *Making Generations: Birthrites and the Roots of Becoming*, the exhibition will draw upon the life cycle anthropology and art collections in the Smithsonian collections to present a comprehensive,

yet unique, insight to the cultural interpretations of this universal experience.

Exhibitions Beginning Tours October 1, 1984, through September 30, 1985

- America's Space Truck (II)*
- Artists and Models: Portraits from the Hirshhorn Museum and Sculpture Garden*
- Athletes and Heroes: Portraits from the Time Collection at the National Portrait Gallery*
- Audubon: Science into Art*
- Baseball Immortals: The Photographs of Charles Martin Conlon, 1905–1935*
- Beauties of the Coral Reef (II)*
- The Dog Observed: 1844–1983*
- Ebla to Damascus: Art and Archaeology of Ancient Syria*
- Eva Zeisel: Designer for Industry*
- Exploring Microspace*
- Genre Scenes: Works on Paper from the Hirshhorn Museum and Sculpture Garden*
- Homage to Amanda: 200 Years of American Quilts from the Collection of Edwin Binney 3rd and Gail Binney-Winslow*
- The Laser at 25*
- Material Evidence: New Color Techniques in Handmade Furniture*
- Mathew Brady Photographs from the National Portrait Gallery's Meserve Collection*
- Mouton Rothschild: Paintings for the Labels*
- Music and Dance in Papua New Guinea*
- Newcomb Pottery: An Enterprise for Southern Women, 1895–1940*
- New Vistas: American Art Pottery 1880–1930 from the Cooper-Hewitt Collections of Greece: Myth, Science and Art*
- Power and Gold: Jewelry from Indonesia, Malaysia and the Philippines*
- Radiance and Virtue: The R. Norris Shreve Collection of Chinese Jades*
- Recent American Works on Paper*
- Sharing Traditions: Five Black Artists in 19th Century America from the Collections of the National Museum of American Art*
- Three Centuries of German Painting and Drawing from the Collections of the Wallraf-Richartz Museum, Cologne*

Tours for Period October 1, 1984, through September 30, 1985

Number of bookings	365
Number of states served (including Washington, D.C.)	47
Estimated audience	8 million
Exhibitions listed in last <i>Update</i> (catalogue of SITES exhibitions)	113
Exhibitions produced for tour during this year	24



Left to right, Leo Durocher, Bill Terry, and Lefty Gomez at the opening reception for Baseball Immortals, 1905–1935: The Photographs of Charles Martin Conlon, an exhibition organized by the National Portrait Gallery and circulated by the Smithsonian Institution Traveling Exhibition Service.

PUBLIC SERVICE

Ralph C. Rinzler, Assistant Secretary for Public Service

Office of Elementary and Secondary Education

A firm belief in the power of museum objects as educational resources is the guiding principle behind the activities of the Office of Elementary and Secondary Education (OESE). Through its programs and publications, the OESE works with other Smithsonian education offices to foster the educational uses of museums in the Washington, D.C., area and throughout the nation.

OESE seminars and courses for teachers demonstrate how to teach by using a museum-oriented approach. In 1985, a series of summer seminars in history, art, and science provided professional training for three hundred Washington, D.C., area educators. In addition, a three-credit graduate course, "Using Museums to Teach Writing," was offered to teachers from across the nation. And the OESE Regional Workshop program helped museum

educators build partnerships with school teachers in Oakland, California; Charleston, South Carolina; and Oak Ridge, Tennessee—serving a total of one thousand teachers and twenty-five hundred members of the general public.

Publications designed to help teachers use museums and other community resources with their students are a key aspect of OESE programming. In addition to its regular periodicals, *Let's Go to the Smithsonian* and *Art to Zoo*, the office produced booklets on how to teach from objects as well as a calendar advertising programs of all the Smithsonian education departments in the Washington area. For junior high school readers, *Journeys*, a pilot magazine published in cooperation with the Office of Public Affairs, discusses in depth topics ranging from whales to rockets.

In addition to continuing its work in making programs and exhibitions accessible to disabled visitors here at the Smithsonian, the office is producing a docent training manual, to be accompanied by a videotape, to encourage accessibility in museums across the U.S. For learning disabled students, a curriculum kit designed to teach concepts of historical time is being developed.

During the 1984–85 school year, the OESE expanded its programs for young people. Its Career Awareness Program—part of the Institution's affirmative action effort—offered summer placements for program graduates, giving them an opportunity to deepen their career awareness while serving as volunteers or as paid interns. Its "Exploring the Smithsonian" brought more than fifty-four hundred D.C. public junior high school students for curriculum-related museum lessons. And its Summer Intern Program—which places outstanding high school graduates in curatorial or technical offices—was for the first time open to students in Department of Defense Dependent Schools.

Through teacher training programs, publications, special education programs, and precollege training for young people, the OESE continues to help teachers and students effectively use museums as educational resources.



Shown here moving a painting is a summer intern of the Office of Elementary and Secondary Education, who was stationed in the Registrar's Office of the National Museum of American Art. (Photograph by Jon Dicus)

Office of Folklife Programs



The Louisiana program's Mardi Gras float drew tremendous crowds that came to celebrate the state's rich folk traditions during this year's annual Festival of American Folklife.

Most Americans would agree that the richness of our nation's culture lies in the impressive diversity of its people and in their creative responses to historical conditions. Research, presentation, and preservation of this cultural wealth is the goal of the Office of Folklife Programs, an effort that entails, among other activities, the presentation of living folk traditions in the context of the National Museum. Since its inception, the Office of Folklife Programs has directed its attention to the identification and study of folk traditions and to the development of methods for presenting them in a national setting to general audiences. The Office of Folklife Programs also cooperates with other Smithsonian bureaus in research and exhibition production; it publishes documentary and analytic studies and its staff undertakes both exhibition-oriented and publication-oriented research.

Festival of American Folklife

The Office of Folklife Programs planned and produced the nineteenth annual Festival of American Folklife which took place June 26–June 30 and July 3–7, 1985. Cosponsored by the National Park Service, this year's Festival featured an Indian fair, Louisianan folklife, cultural conservation, and evening dance parties. Attendance reached over 1.2 million visitors.

The Smithsonian and the Government of India collaborated to mark the Festival of India 1985–1986 with the program, "Mela! An Indian Fair." The program presented seventy Indian and Indian-American folk artists who demonstrated an array of India's performing and ritual arts, crafts, and festival food traditions in a re-created Indian

bazaar. Featured were a Learning Center and the burning of a 40-foot-tall effigy of the legendary demon Ravana and his two cohorts.

The rich cultural diversity generated and nourished in Louisiana, "The Creole State," was featured with ninety representatives who presented their music, dance, crafts, occupations, and foodways. Cajun and Zydeco music, crawfish boils and Mardi Gras parades were among the traditions presented.

The Cultural Conservation program explored issues involved in conserving cultural traditions in the world's indigenous, ethnic, and regional communities. Traditions from around the world—among them Puerto Rican maskmaking, Guatemalan Mayan Indian weaving, Kmhmu basketry and Salvadoran, Italian-American, and Chinese-American cooking were presented.

Special Projects

In cooperation with the National Museum of Natural History, the Office of Folklife Programs coordinated the exhibition, *Aditi: A Celebration of Life*. The Evans Gallery, redesigned to simulate a rural Indian environment, hosted 2,000 objects of Indian folk art, as well as forty artisans and performers demonstrating their traditional arts. *Aditi* was accompanied by the publication of a catalogue designed by Daphne Shuttleworth and coauthored by Richard Kurin, both of the Office of Folklife Programs, and published by Smithsonian Institution Press.

Research

Research, writing, and production continued on monographs and accompanying films included in the *Smithsonian Folklife Studies* series. Established in 1978, this innovative series couples book-length monographs with accompanying ethnographic films to document and analyze particular traditions more fully than would be possible with either medium used alone. *The District of Columbia Fire Fighters' Project: A Case Study in Occupational Folklife* by Robert McCarl, a monograph which developed from research for a 1976 Festival program, was published this year.

The Stone Carvers, a film by Marjorie Hunt and Paul Wagner, was awarded an Academy Award for best short documentary for 1985. The film, highlighting carvers at the Washington Cathedral, grew out of 1978 and 1979 Festival programs.

The Office of Public Affairs (OPA) acquaints the public, via the communications media and other means, with the Smithsonian's research, its many exhibitions and activities, and its permanent collections. The office also oversees Institution-wide information programs.

During the year, the OPA coordinated publicity for the Smithsonian's participation in the nationwide Festival of India, working with the Embassy of India and the Indo-U.S. Subcommittee on Education and Culture, preparing background materials and photographs for media distribution, collaborating with each bureau featuring Indian exhibitions and performances, arranging a news conference to launch the Festival of India at the Smithsonian, and producing public service announcements for television and radio.

In addition, two public affairs writers traveled in India for six weeks to study India's past, present, and future. Their firsthand account became a special thirteen-part series on India Today for the Smithsonian News Service, the Institution's free, monthly feature-story service for daily and weekly newspapers. These stories were widely used by the media, while articles on the Festival's *Aditi* exhibition and the Mela, or Indian fair, at the annual Folklife Festival were numerous.

The Smithsonian's image overseas was broadened and enhanced by a five-part series on the Institution's museums in the June and July issues of *Paris Match* magazine. The OPA arranged interviews for the *Paris Match* reporter and photographer. Hundreds of other journalists were assisted with information and interviews by public affairs staff.

In fiscal year 1985, the OPA issued more than five hundred news releases on Smithsonian activities. The OPA also provided publicity assistance to other Smithsonian bureaus and offices. The OPA planned a major publicity campaign for the Anacostia Neighborhood Museum's exhibition, *The Renaissance: Black Arts of the Twenties*, focusing on the explosion of black creativity in Harlem and elsewhere. The office helped publicize the opening of the new Archives of American Art facility in Los Angeles and other AAA projects. Publicity prepared on the discovery of the world's deepest plant by scientists at the National Museum of Natural History led to extensive

A member of the Bishnois community in the desert state of Rajasthan in western India proudly demonstrates his beard-combing technique. Such folkways and traditions, as well as space-age topics, were included in a thirteen-part package bonus edition, *India Today*, of the Smithsonian News Service. (Photograph by Jessie Cohen)



Office of Smithsonian Symposia and Seminars

media coverage. Public affairs staff members also worked with the Smithsonian National Associate Lecture and Seminar Program successfully to publicize the pioneering visit of Smithsonian experts to Tokyo.

The Smithsonian News Service completed its sixth year of operation with the distribution, in addition to the special India Today series, of forty-eight richly illustrated articles on subjects ranging from the suffragette movement to the development of the laser. The News Service joined the electronic age, sending stories from its computer to the computer of one of the nation's largest dailies, the *Chicago Tribune*. The National Association of Government Communicators awarded its first and third prizes in the feature release category of its nationwide Blue Pencil Contest to News Service stories.

The OPA expanded its project funded by the Educational Outreach Fund to encourage visits to the Smithsonian by members of minority communities. Emphasizing the theme, "Explore Your Heritage," a television public service announcement produced in fiscal year 1984 featuring Colonel Guion "Guy" Bluford, the first black American astronaut in space, was extended nationally, reaching all states.

To encourage visits to the Smithsonian from all parts of the United States, the OPA produced a thirty-second and a ten-second television public service announcement package with the theme of the Smithsonian as a repository of American history to be shared with each new generation. The spot, narrated by Bob Hope, was close-captioned for the hearing-impaired audience. A fiscal year 1984 announcement was awarded a Gold Screen Award by the National Association of Government Communicators.

The OPA's publications program led to a new edition of the Smithsonian's general information *Welcome* brochure, with more than one million copies printed. OPA-prepared flyers advertising the "Smithsonian World" television program were distributed to the public. The quality of Smithsonian publications was also recognized by outside organizations. *The Torch*, the Smithsonian's monthly staff newspaper, received the top honor in the Society for Technical Communications International Publications Competition. *Research Reports*, a three-times-a-year periodical describing Institution-related research in the arts, history, and science, also received awards from that society and top honors in the American Association of Museums publications contest.

The major program of the Office of Smithsonian Symposia and Seminars (OSSS) was an unprecedented gathering of fifty Indian and American scholars, artists, scientists, and cultural leaders, convened by the Smithsonian as a key Festival of India program designed to have long-range influence. "The Canvas of Culture: Rediscovery of the Past as Adaptation for the Future," a public symposium held June 21–24, 1985, addressed vital issues in nature and culture in India today. After consultations with a wide range of individuals in India and the United States engaged in studying and effecting processes of change, project director Carla Borden felt that "emphasizing aspects of contemporary Indian life—roots, current experience, and prospects—would provide a welcome challenge, a unique and promising opportunity for analysis and learning." The encounters between people who ordinarily would not all meet and talk together (a "dazzling assembly of some of the best minds in India") created great excitement and she has begun editing a book based on the individual contributions of participants and their interactions during the symposium.

The symposium's agenda was designed around varied and complex subjects. The inclusion of religion, the environment, the arts, architecture, social trends, and science and technology in a single program illuminated their interrelationships and suggested new frameworks for understanding and action. As Smt. Pupul Jayakar, chairman of the Indian Advisory Committee for the Festival of India and symposium cochairman (with S. Dillon Ripley), eloquently stated: "The symposium . . . seeks to reflect the changing face of India, for no single symbol or icon can reveal it. It seeks to ask questions—questions which have no immediate answers or solutions but need to be held on the ground of mind, to be pursued relentlessly." With so short a time available there could be no expectation of comprehensiveness; what was presented were selected and personal points of view from people whose work has been thoughtful, influential, and provocative. Opening ceremonies featured greetings sent by Prime Minister Rajiv Gandhi and the Honorable J. William Fulbright and a message from the White House's Office of Science and Technology Policy.

Despite the intensity of the schedule, sessions were well attended and participants eager to hear one another's presentations. One remarked about so many individuals from numerous fields of endeavor, without comparing notes beforehand, "meshing so effortlessly." And another asked, "Why don't we organize a forum like this in India?"

For the American audience, the symposium demonstrated that reinvestigating and using the past transcended



Preparations continue for the ninth symposium in the Smithsonian's international series tentatively titled "Constitutional Roots, Rights, and Responsibilities." The symposium is the centerpiece of a major educational program on civics and representative government based on two hundred years of history unique to the U.S. As part of the Bicentennial observance of our Republic's founding document, the project will address the history of ideas, self-governance, and duties and privileges of citizenship and draw into its activities students, public citizens, representatives from the media, business and industry, law and government, historians and other scholars, and the general public. The office continues to develop plans for this May 1987 commemoration and projected publications.

Left to right: Raj Rewal, Balkrishna Doshi, and Charles Correa, three of India's most distinguished architects, listen to a question from the audience for "Contemporary Reinterpretation of Traditional Architecture." Office of Smithsonian Symposia and Seminars.

the "Raj nostalgia" filling the media in preceding months. The focus on contemporary Indian culture, especially literature and painting, was in itself a big step, a U.S. scholar commented, too little being known about them in the United States and few recognizing that there *is* so much to know. Mr. Ripley was "hopeful that the Festival (would) bring into American hearts a sense of India's reality and of the kinship between our two great Republics." While encouraging, increasing, and broadening appreciation of modern India's variety and richness through such a panorama of topics and talent, the symposium laid a foundation for ongoing exchanges and discourse to which the published volume will contribute further.

Nineteen eighty-five brought an additional staff assistant, Mary Rebecca Dodson, modest informal furnishings for the Margaret Mead Seminar Room (occupying the attic area over OSSS headquarters), and another deposit into the Barrick W. Groom Endowment Fund, established for the office's general interdisciplinary activities. Among the latter, of special interest was "Public Enjoyment of Irish Legacies: Castles, Gardens, and Scientific Wonder," featuring the Honorable Desmond Guinness and Lord Rosse, who discussed landmarks such as Birr Castle and its famous telescope, the world's largest at that time, built by local craftsmen in 1842 under the direction of his ancestor, the "Astronomer Earl."

Office of Telecommunications



Underwater cinematographer Ralph Nelson captures the world of coral reefs for a Smithsonian documentary, "The Sea: A Quest for Our Future," a one-hour film examining newly discovered coral reefs in the Caribbean and their potential impact on the world's food resources. Office of Telecommunications. (Photograph by Nekton Productions)

The Office of Telecommunications (OTC) extends the Smithsonian's educational outreach by taking the museums and their research to the public through distinctive films, radio, and television programs. In 1985 OTC reached its largest audiences ever through its ongoing programs.

The office was actively involved in the promotional efforts on behalf of three PBS telecasts of OTC films: *The Sea: A Quest for Our Future*, our first hour-long film in late November; *The Work of Peace on the Treaty of Paris* in late June; and *In Open Air: A Portrait of the American Impressionists* in July. All three programs were broadcast nationally on the PBS network, affording us audiences in the millions. Our promotion efforts included press kits for the PBS stations, press releases, photographs, ad slicks, and video and radio promo announcements.

Two films were completed which focused on the work of the Marine Systems Laboratory: a half-hour version of *The Sea* produced for the educational market and *Blue Planet*, a 15-minute production to accompany the new marine ecosystems exhibition in NMNH's Hall of the Sea.

The National Endowment for the Arts awarded two grants to the Theatre Historical Society of America so that OTC could produce two new versions of the 22-minute exhibition film, *American Picture Palaces*: \$10,000 for an 8 to 10-minute version to be distributed by the short Film Showcase to about 2000 theaters throughout the U.S., and \$20,000 for a 28-minute film for PBS television broadcast and nontheatrical use in schools and libraries. Gene Kelly hosts the films with some new footage shot at California movie palaces.

Radio Smithsonian, the half-hour weekly series available by subscription and now in its sixteenth year, gained new audiences through last fall's "American Stories" series-within-a-series. Broadcast by almost 100 stations nationwide, the "Cowboys" program from that mini-series was awarded Best of Competition by the National Association of Government Communicators. The *Radio Smithsonian* series as a whole also won that competition's Outstanding Audiovisual Production award. Our other radio project, *Smithsonian Galaxy*, the series of 2 1/2-minute features on research and exhibition topics, continues to reach audiences over more than 230 stations nationwide and overseas.

Here at the Smithsonian . . ., the 2-minute features for television that focus on lively people and events around the Institution, added the four public TV stations of Connecticut to its roster of subscribers. This series also made its foreign debut through the Smithsonian National Associate Program which used it as part of its museum presentations in Japan.

As the Smithsonian Institution Press (SIP) completes yet another year, the growth and expansion evident in the past continues at a noteworthy pace. With the quality of publications at a consistently high level and the number of awards and honors for individual publications on the increase, the more quantitative elements, such as total sales, net returns, and manuscripts published, still continue to rise. There has been an 8 percent increase in total jobs done by the Press (322 in fiscal year 1985), a 21 percent increase in gross sales over fiscal year 1984, and an astonishing 97 percent increase in net earnings for the current year.

In this year of increases, plans were laid to bring all three elements of the Press—Smithsonian Books, the Recordings Division, and the University Press—under one roof for the first time. This move was designed to complete the consolidation of functions begun two years ago. The combination of management, production, business, and marketing elements produces a solid cohesiveness among Press operations while retaining the advantages of three distinct and individually administered functional areas.

Through all of this there has been a strengthening and consolidation of the core function of the Press: to place the scholarship, research, collections, and activities of the Institution before the public by publishing books, recordings, and reports. This reflects a successful implementation of the innovative five-year plan for the Press, introduced this year by Director Felix Lowe, which features major increases in manuscript acquisition spearheaded by Daniel Goodwin and Kathy Kutzt, the Press' new full-time acquisitions editors. Another element of this plan is the introduction of a Museum Services function, now in the planning stage, which is expected to produce annually more than two hundred catalogues, journals, scholarly monographs, brochures, museum and exhibition guides, posters, and miscellaneous productions, which are now the responsibility of the University Press division.

Yet another manifestation of this plan is the recent introduction and expansion of computer technology as an increasingly vital aspect of the publishing process. For example, the number of University Press manuscripts received from authors in electronic form has increased substantially. One-third of all *Contributions* and *Studies* publications issued this year were edited on Press terminals using the Word Processor to Typesetting procedures established by the Press. These manuscripts were received either by telecommunications or as compatible disks, and originated on a wide variety of computer equipment. The Press continues to concentrate on devising efficient methods for

editing and design of electronic manuscripts; the most recent development is a system of "tagging" manuscript elements that blends information management with typographic markup. The tags are added by the author as the manuscript is organized and written. After editing is accomplished, a designer supplies typesetting specifications to be activated by each tag. In addition, the Series Section staff, under Barbara Spann's supervision, concentrated on two major emphases in the fiscal year just concluded: (1) completing the editing on all manuscripts that had any chance of fiscal year 1985 funding, and (2) implementing the use of IBM PCs in the word-processing-to-typesetting procedure.

All promised manuscripts were finished on time and significant progress was made in computerizing the editing process. A pilot project in fiscal year 1984 brought in six manuscripts by telecommunication to the Micom; the resulting edited disks were used for typesetting. Of the twenty-nine Series manuscripts sent to the typesetter in fiscal year 1985, nine were on disks. By way of forecast, six of the eight manuscripts already accepted for editing in fiscal year 1986 will be handled as electronic manuscripts.

In the number of books and recordings published this year by the Press, many of them award winning, the work of a very talented and dedicated staff is evident. For example, the National Academy of Recordings Arts and Sciences Award (the famed "Grammy") for Best Historical Album—*Big Band Jazz*—went to its producer J. R. Taylor, Executive Producer of the Smithsonian Institution Press Recordings Program. The "Grammy" for Best Album Notes for the same album went to SIP Editor for Special Projects, Martin Williams, and to Gunther Schuller, a member of the Smithsonian Council. Meantime Carol Beehler, SIP designer, was the recipient of the 64th Annual Award of Merit from the Art Directors Club of New York for her work on *Drawn From Nature*. She also received the Association of American University Presses Book Award for the same work.

Acknowledgment of the quality of SIP publications is implicit in the awards and honors accorded to individual books and recordings, as well as in the year-long publication of favorable critical reviews in various media. Especially gratifying is the recognition of the Smithsonian Institution Press as an important peer among commercial and scholarly publishing houses nationwide. This is evidenced by the increasing number of copublishing ventures, this year alone, and the numerous requests from well-established commercial publishing houses to contract with the Press for distribution rights in the United States and abroad. And so the diffusion of knowledge increases.

Smithsonian magazine is the official magazine of the Smithsonian Institution and to many of its primary audience of 4,000,000 and pass-along audience of an additional 3,000,000 it represents the only experience they have of the Smithsonian Institution.

The magazine, by a considerable margin, has the largest circulation of any museum-affiliated magazine in the world and through its pages manifests month after month the educational message of the Smithsonian. It accomplishes the educational purpose in a systematic fashion since it regularly covers every subject area the Smithsonian museums themselves do: Art, History, Natural History, Science, Technology.

While it deals directly with the Institution every month through columns such as the Secretary's "Horizon," Ted Park's, "Around the Mall," Constance Bond's, "Smithsonian Highlights," and while it describes major Smithsonian events such as the change in the Secretariat, it is not a house organ in the usual sense of the word; nor was it ever intended to be. Rather its mandate is not only to represent the Smithsonian explicitly but also to deal with what the Smithsonian might be interested in.

Every year the magazine finds more than half a million new reader-members. These members, along with existing members, are eligible for other Smithsonian programs: books and records from the Smithsonian Institution Press, educationally related gifts from the Museum Shops and Catalogs, Tours from the National Associate Program, and Regionl Events.

The magazine also provides a constant flow of new members to the Contributing Membership, the Resident and Cooper-Hewitt associates programs. For these programs the magazine is the principal and most valued benefit of membership.

The museums themselves are places of enchantment and magic whose spirit is extraordinarily difficult to translate since the exhibit objects themselves are so powerfully evocative. But the magazine over the years by superlative writing and color photography has attracted and held its appreciative audience.

It is the assumption of the writers of this brief statement that nearly everyone who reads *Smithsonian Year* is also familiar with the magazine, that is to say, the magazine speaks for itself. The highlights of the year, in brief, other than those references which appear elsewhere in *Smithsonian Year*, are as follows:

On the business side the vital signs of the magazine remain healthy. The renewal rate was steady at its traditional high rate. Advertising income was up 20 percent in a year during which many magazines experienced difficul-

ties. Audited circulation stood at 2,173,000, highest in the magazine's history. Surplus generated for unrestricted usage was also at its highest level. During the year the magazine celebrated its 15th anniversary. One measure of change: 892 pages printed in first full year of publication, 1971; in 1985 2,334 pages.

The transition from Secretary Ripley to Secretary Adams was a major event at the Institution, and one of importance not only to Associates but also to others who have significant contact with the Smithsonian. The magazine dealt with this transition in two major stories, the first summarizing the accomplishments of the Ripley years, the second introducing the readers to the new Secretary.

Among the year's editorial highlights were three stories dealing with the issue of standards in primary and secondary education; the subjects were resurgence of the McGuffey Reader, the Boston Latin School, and the Bronx High School of Science. This year *Smithsonian* was recognized at the American Magazine Awards as a finalist in the general excellence category for large-circulation publications.

Visitor Information and Associates' Reception Center

The Visitor Information and Associates' Reception Center (VIARC) is a focal point for central information, assistance, and membership services for the public, Associate members, Smithsonian staff, volunteers, and interns. Many of its activities function seven days a week and involve the coordination and direction of large numbers of volunteers who constitute a primary source of support for the Institution's public information programs and for assistance behind the scenes.

This was another extremely busy and productive year for VIARC. One development, however, clearly ranks as the most important in its fifteen-year history: the designation by Secretary Robert McC. Adams of the Great Hall of the Smithsonian Institution Building as the site for the long-discussed Smithsonian Information Center. The Secretary's subsequent approval of a design concept for the Center, developed by an appointed committee, signaled the immediate search for funding.

Another VIARC endeavor, the development of an Institution-wide exterior graphic information system, progressed significantly with refinement of the design concept and production of prototype components by the Office of Exhibits Central.

Activities initiated this year were many and varied. To broaden minority participation in the volunteer corps, discussions on effective recruitment were held with leaders of black, Asian, and Hispanic communities. A slide presentation showing the range of Smithsonian volunteer opportunities was created as a multi-purpose volunteer promotion tool. Three supplemental services were incorporated in the regular VIARC schedule: Saturday public tours of the Castle, orientation coffees for Smithsonian interns, and information desk services at the Gallery Place museums. Smithsonian orientation programs became a basic component in the training for Tourmobile guides and, in cooperation with the U. S. Tour and Travel Administration, were presented in foreign languages for international tour organizers. A variety of new publications were produced including *Info Special*, a newsletter for VIARC Information Specialists; *Smithsonian Museums At-a-Glance*, a flyer for distribution by members of the local and national travel industry and VIARC's summer mobile information units; *Management of Museum Volunteers*, a booklet for museum professionals; and a set of five illustrated bookmarks to use in response to children's letters. VIARC's plastic tote bag, created in cooperation with *Smithsonian* magazine to promote Associate membership, was a Merit Award winner in the 1985 Printing Industries of America Graphic Awards competition.

The Telephone Information Program responded to a record nineteen thousand inquiries in July due to requests for previsit information and great public interest in *Aditi: A Celebration of Life*, the Festival of American Folklife, and the space shuttle film *The Dream Is Alive*.

VIARC records also indicate that the Public Inquiry Mail unit continued to handle thousands of letters; 1,147 volunteers served behind the scenes; intern registration escalated 24 percent, and the annual Institution-wide volunteer survey confirmed 4,802 individuals contributed 439,02 hours of service to the Institution.

ADMINISTRATION

John F. Jameson, Assistant Secretary for Administration

The Institution operates effectively as a highly decentralized organization with programs extending across the country and with projects in many foreign countries. A variety of central support offices work to assure the success of scholarly and public activity and at the same time provide central oversight and accountability for the management and use of financial, personnel, and physical resources. These organization units include accounting and financial services, audits and investigations, congressional liaison, contracts, equal opportunity, facilities services (including design and construction management, plant services, and protection), general counsel, information resource management, management analysis, personnel administration, printing and photographic services, programming and budget, risk management, special events, supply services, and travel services. Funding for these central services amounts to only about 7 percent of the Institution's total operating expenses exclusive of the costs of maintenance, operation, and protection of facilities.

Administrative and Support Activities

The major overall emphasis by the administrative and support units was two-fold: provide effective and timely services to their users and assure that the Institution maintained a high level of control and accountability as a public organization. In a coordinated effort involving the Office of the Assistant Secretary, the Office of Programming and Budget (OPB) and the Treasurer's Office with the involvement of bureaus and offices throughout the Institution, the *Five-Year Prospectus, FY 1986-1990*, covering the Smithsonian's program and facility development plans, was prepared for approval by the board of Regents at the January 28, 1985, meeting. Work started soon thereafter on the draft prospectus for fiscal years 1987-1991 for Regents' review at its September 16, 1985, meeting. Under the Secretary's guidance, the Office of Programming and Budget incorporated many opportunities into the formulation of the fiscal year 1986 unrestricted Trust fund and the fiscal year 1987 Federal budgets for increased participation by program managers and administrators throughout the Institution at each stage of budget review and decision making. OPB also expanded the application of automated systems to budget analysis, monitoring, and budget presentation, including the extensive use of computer spreadsheets. In October 1984, OPB presented its fifth budget formulation workshop, "Budgeting in an Election Year," which was attended by approximately 60 staff from throughout the Institution.

As the Office of Information Resource Management (OIRM) completed its third year of activities, significant technical and management changes were underway. The Institution continued the transition from a central data processing technology to distributed data processing using microcomputers, minicomputers, and a new computer mainframe, tied together by a data communications network. The Smithsonian Institution Bibliographic Information System, a turnkey system for libraries, archival units, and individual bibliographies, was expanded to include additional functions, such as acquisitions, and to serve more users. Software for the information retrieval component of a new specimen Collections Information system was selected and high level systems design was completed as were plans for starting up the system. A new computer mainframe was installed and initial training of technical staff was begun, preparatory to implementation of production systems on the machine during fiscal year 1986, notably the specimen collections system. Work continued to define requirements and technical specifications for an automated system for personnel management, preparation of payroll, and reporting of information. Planning for an Institutional raceway for voice, data, and image communi-

cations was advanced. An information center trained staff in the use of information systems and computer capabilities.

The Office of Personnel Administration assumed responsibility for civil service and trust employee benefits activities which had previously been managed by three separate offices. This consolidation will enhance communications and counseling on matters of substantial interest and concern to employees and will facilitate analysis of benefits programs, costs, and alternatives. Improvements in the administration of the unemployment insurance program were made with resultant savings. The Performance Management Review System was implemented and a new program for training custodial workers was established.

The Office of Equal Opportunity (OEO) emphasized special recruitment efforts for minorities and women and for disabled persons in all categories of employment. Goals for minorities and women were established Smithsonian-wide and at each organizational level for professional, administrative, and technical positions. The representation of minorities and women in professional and administrative positions and grades above grade 12 improved. Goals for disabled persons were established Institution-wide, and the representation of such persons increased. The outreach program continued to inform minorities, women, and disabled persons and their advocate organizations of Smithsonian programs, exhibitions, activities, and careers. Outreach efforts included equal opportunity exhibition displays and handouts at conferences held by the National Institute for Women of Color, The President's Committee for the Employment of the Handicapped, Women in Science and Engineering, League of United Latin American Citizens, the National Federation of Business and Professional Women, and the National Urban League. In addition, equal employment messages were placed in four minority and women's publications that reached an audience of approximately two million people. Special outreach efforts were directed to developing more useful relationships with the Hispanic American and Asian American communities and organizations. These included participation in ethnic group conferences, programs and cultural observances, and the establishment of a networking system for continuous liaison. The objectives to increase the number of Hispanic and Asian applicants for employment and to become more aware of the needs and concerns of these ethnic groups were essentially attained. OEO published two brochures for employees and the public: *How the Discrimination Complaint System Works at the Smithsonian Institution* and *Equal Opportunity Programs of the Smithsonian Insti-*

tution. In addition, guidelines to improve facility and program accessibility for disabled visitors were developed by five task forces composed of bureau personnel in conjunction with Equal Opportunity staff.

Activities in the Office of Printing and Photographic Services centered on collections management and education projects. To guard against the perils of air pollution causing damage to the photographic collections an activated charcoal filtration unit was installed in the cold storage room. Initial plans were made for the expansion of the room to meet growth requirements. A total of about 130,000 hazardous nitrate negatives have been converted to safety film. When completed, attention will be turned to other deteriorating types of film and the conversion of glass plates to prevent breakage. A research program into applied photographic preservation was initiated. The Office continued the production of video discs centering on the completion of the 35mm color slide files. The Office has remained active in photographing objects for collection management, including a large quantity of watches from the Division of Mechanisms and assistance to the National Numismatics Collection in the inventory of their materials. To provide photographic documentation of historic events, the Office has continued its photography of important events in and around the Washington area. These included the Burial of the Unknown Soldier, Rededication of the Vietnam Veterans Memorial, Presidential Inauguration, and others. Based on this photography, the Office mounted its second annual exhibition, *History As Seen from the National Museum of American History*, in August 1985. The Office staff continued to be active in teaching programs both in and outside the Institution. The Office produced another photographic workshop for museum professionals under the Office of Museum Programs. The Office also continued to cosponsor a one-day workshop for local high school students with the White House News Photographers Association. During the year, the Office moved its Color Laboratory from a facility in the Arts and Industries Building into new specially designed space in the National Museum of American History, thus ending a continuous 105-year occupation of the A&I space by Smithsonian photographers.

Other central services continued active administrative and technical support for the Institution's programs. The Office of Supply Services designed and implemented an automated tracking system and management reports which will assist communications among itself, the accounting office, and bureaus and offices as to the status of procurement actions and contracts. The Office exceeded its goals for the use of small and minority-owned

businesses. An effective property management system resulted in tight controls on inventory and obtaining a large amount of excess property for use. The Management Analysis Office monitored the progress of actions needed to strengthen internal controls and continued its program of bringing to the Institution for the summer carefully selected students in graduate schools of business administration to work on important management projects. This past year five postgraduate students worked in the audit, supply services, information resource management, and museum shop offices. The Office of Audits established an investigative branch to examine possible criminal activities by employees or contractors and review programmatic and operational weaknesses susceptible to fraud or abuse. As the principal coordinating and organizing unit for Smithsonian events that emphasize institutional programs and activities, the Office of Special Events managed several hundred events each year. The Office also received nearly a thousand requests from outside organizations wishing to use Smithsonian space and determined which of these met the policy requiring that such events be closely related to the Institution's own museum and education programs.

The Travel Services Office (TSO) continued a busy schedule of travel arrangements including those for the Festival of American Folklife, which featured participants from India and Louisiana; the Smithsonian Foreign Currency Program; the *Precious Legacy* exhibition of the Smithsonian Institution Traveling Exhibition Service; and various research projects such as those in Cerro de la Neblina and the Seychelles. In addition, a credit card program has been implemented to phase out the use of Government Transportation Requests (GTR's) for the purchase of tickets. Preliminary plans have been made to set up a computer link between the TSO and the Office of Accounting and Financial Services to facilitate the processing of ticket reports, credit card statements, and other related records.

Highlights for the Office of Facilities Services and its components included completion of the South Quadrangle project concrete structure and roofing systems as well as partial installation of mechanical and electrical systems and interior partitioning. Construction is expected to be complete in the spring of 1986. Other activities during the year under the direction of the Office of Design and Construction included master facilities planning at the National Museum of American History; National Museum of Natural History, the Whipple Observatory in Tucson, Arizona; the Silver Hill Facility in Suitland, Maryland; and the Smithsonian Tropical Research Institute in

Panama. Major exterior restoration work continued on the Art and Industries Building with completion scheduled for 1987, and on the Renwick Gallery facade with completion planned for 1986. Construction of the Anacostia Neighborhood Museum annex began during the year with completion scheduled for 1986. Major environmental and fire protection improvements as well as work associated with removing or encapsulating asbestos continued at the National Museum of American History and at the National Museum of Natural History. Work also progressed on the design development and installation of the new specimen storage system at the Museum Support Center. Major design efforts began at the Smithsonian Tropical Research Institute on a dormitory to house visiting scientists on Barro Colorado Island as well as on the Earl S. Tupper Research and Conservation Center.

Significant progress was made in the Office of Plant Services during the past year. Most notable was a major reorganization to improve the quality of service and support and overall efficiency in operations. Other improvements underway include the implementation of an automated information management program and acquisition of computer equipment and software applications for consolidating and improving financial, personnel, and program management activities performed by the office; and replacement of the computer system to improve energy management and analysis. Energy conservation efforts continued during the year, avoiding costs by about \$500,000. Efforts to reduce long distance telephone and mail costs also continued through an aggressive communications cost avoidance program. Significant progress was also made in reducing the backlog of projects and in improving administration of the work hour quota system. Work on real property records continued for all Smithsonian owned and leased buildings and structures.

Significant progress was made in the Office of Protection Services during the last year. The safety and health division realized gains in all its program areas in 1985. An industrial hygiene branch organized late in 1984 focused its activities on asbestos abatement and control and on other work place hazards. An extensive project to validate the asbestos contamination index developed by the Smithsonian staff has been undertaken. The success of the overall safety effort was recognized by receipt of the President's Safety and Health Award given for 1983. The award is based on a rating of agency safety and health programs and compensation costs.

Programs to upgrade security devices throughout the Institution and to provide a proprietary alarm system are continuing, with completion of the alarm system expected

by December 1986. The security force sustained both its effective service to visitors and the protection afforded to Smithsonian buildings and collections.

Service to the overall museum community included a very successful conference on museum security, organization of a program to certify professionals working in museum security, and completion of a *Manual of Basic Security* for the International Council of Museums' Committee on Museum Security.

Smithsonian Institution Women's Council

The Smithsonian Institution Women's Council was established by Secretarial memorandum in 1972 to identify and study the concerns of employees, to serve as an active advisory group on women's issues for management, and to work for the improvement of employees' conditions with particular concern for encouraging the hiring, promotion, and equal treatment of women. The Council's open monthly meetings are held the second Wednesday of each month in the Regents' Room of the Castle. The work of the council is mainly done by several standing committees (Information Processing, Training, Services and Benefits, Daycare, Newsletter) and *ad hoc* committees devoted to Council projects; Susan Kalčík is chairperson.

Projects this year included coordinating and publicizing events held throughout the museum in conjunction with Women's History Month at the Smithsonian; a series of tax seminars; and a poetry reading by author May Sarton, cosponsored with Resident Associate Program. Members also worked on a brochure to introduce the Council and its activities, extended the distribution system of the newsletter (*4 Star*) to reach all employees, and worked to establish daycare centers in several museum buildings. The biennial election for a new Council took place in October.



Clara MacIntyre, a member of the Women's Committee and originator of the High School Competition, presents an award to Nicole Bonds, one of the thirteen finalists.

Smithsonian Internship Council

The Smithsonian Internship Council was established in 1981 as part of the provisions set forth in OM 820 for intern programs at the Smithsonian Institution. The Council is made up of at least one representative from each bureau or office (usually the intern coordinator) and provides a forum for discussion of issues of concern to staff working with interns. The Council works to set common standards for interns and to improve coordination of internships throughout the Institution.

The Internship Council began fiscal year 1985 by working on projects which were inspired by the revision of OM 820, "Smithsonian Institution Internships," which was issued in March 1984. The OM established criteria for the selection of interns, guidelines for management to follow in the placement and involvement of interns in their programs, and clarified the role of several offices having responsibility for certain Smithsonian-wide internship programs.

Having established basic criteria for interns and having studied the problems interns encounter while relocating for the duration of their internship, the Council produced a handbook for interns. *The Handbook for Smithsonian Interns* serves as a helpful reference, with pertinent information on topics such as: background material on the Institution and its internships; procedures to follow while at the Institution; facilities, services and activities available to the intern; transportation information; and a variety of extracurricular activities.

In an effort to improve the accuracy of data used in reports prepared on interns at the Institution, Intern Registration and Information Services, Visitor Information and Associates' Reception Center, developed the ability to generate computer reports on intern programs throughout the Institution. The cooperation and communication between the Internship Council and Intern Registration and Information Services keeps this information as current as possible. A total of 440 interns were registered at the Smithsonian in fiscal year 1985. That was a twenty-four percent increase over fiscal year 1984. Also, with encouragement from the Internship council and assistance in suggesting ideas for subject matter, Intern Registration and Information Services provides regularly scheduled orientation sessions for all Smithsonian interns.

To aid in the resolution of management issues which relate to interns, the Council is planning a series of workshops for supervisors throughout the Institution. Also, the Secretary's Office is preparing to release a statement of support for the Council's goals.

Projects underway as of the end of the fiscal year include efforts to establish a central stipend fund and to make low-cost insurance available to interns while working at the Institution.

DIRECTORATE OF INTERNATIONAL ACTIVITIES

John E. Reinhardt, Director

The Directorate of International Activities was established on October 1, 1984, to monitor, coordinate, and enhance the Smithsonian-wide array of International Activities. During the first year of its existence the Directorate of International Activities has focused its efforts on developing programs for the International Center of the Quadrangle, and on creating a comprehensive picture of the Institution's existing international programs and relationships, while continuing to respond to the needs of Smithsonian staff for assistance and advice.

Existing International Activities

In fiscal year 1985 for the first time, a systematic survey of Smithsonian international relationships and foreign research has been conducted. The information, which is limited to projects undertaken within the last five years, has been assembled and organized into "A Summary Profile of International Activities" which reveals over 800 projects in some 120 countries around the world. The "Profile" provides us with a tool to analyze our international efforts, and to understand the existing configuration, concentration of collaborations, and the location of significant gaps. It also serves as a reference work to answer questions about Smithsonian activities in particular countries and regions, or about the research and professional interests of particular staff members. The "Profile" is organized by region, subdivided by country, and indexed to Smithsonian staff members. It is planned to revise the "Profile" annually and distribute it widely. The "Profile" was generated by the Office of Service and Protocol (formerly the Office of International Activities) which was transferred from the Assistant Secretary for Public Service to the Directorate in October 1984.

Office of Service and Protocol

Nearly twenty years ago, the Smithsonian first established an office of international activities because of the importance of comparative studies in all parts of the world to Smithsonian research, and because of the increasing complexity of international affairs affecting the conduct of work abroad.

Establishing contacts for research collaboration and encouraging the development of cooperative institutional relationships is a primary objective of the Office of Service and Protocol (OSP). For example, within the past year OSP identified opportunities for Smithsonian scholars to

work with colleagues and institutions in many nations. New links were established with the Korean Advanced Institute of Science and Technology, and a delegation of U.S. museum experts visited in May 1985 to advise planners of the new Korean National Science Center. On June 27, 1985, Secretary Adams and Malaysian Ambassador Dato' Lew Sip Hon signed an agreement at the Smithsonian covering work in the general fields of natural and cultural history and conservation. Discussions, coordinated by OSP, leading to the signing of this agreement, were initiated by Secretary Emeritus S. Dillon Ripley, who visited Malaysia in 1984. It is hoped that the Smithsonian's interdisciplinary projects and collaborative research proposals may receive encouragement and expeditious Malay official approval under the principles which are affirmed in this agreement.

During 1985, OSP worked with the Smithsonian Foreign Currency Program in planning Smithsonian participation in the activities of various official binational commissions that have been established pursuant to intergovernmental agreements. The Smithsonian Institution hosted the June 1985 annual general meeting of the Indo-U.S. Subcommittee on Education and Culture. And, regarding the newly formed U.S.-Pakistan Joint Commission, the Smithsonian has taken an active role in planning the second general meeting of its Subcommittee on Education and Culture, which is to take place at the Smithsonian in November 1985.

OSP continued as well to maintain its service responsibilities to Smithsonian bureaus during 1985. During the course of the year, OSP obtained 93 official passports, 941 foreign visas for Smithsonian staff and grantees, provided documentation and consultation for 79 students and exchange visitors, and arranged programs that brought almost 100 foreign scholars, government officials, and museum professionals together with their counterparts here at the Smithsonian. Among the distinguished visitors which OSP received were Prince Khuzulwandle Dlamini of Swaziland, Queen Noor of Jordan, Mme. Michele Gendreau-Massaloux, French Presidential Advisor on Education, and Ambassador A. Hasnan Habib, with whom OSP coordinated the IMAX film screening of a new Indonesian cultural film, *Dance of Life*. Other liaison services aimed at the facilitation of Smithsonian overseas research and exchanges, while more difficult to quantify, are estimated at 350 during 1985. These services included representing and protecting Smithsonian interests in consultations with foreign affairs agencies, providing professional guidance on immigration matters, obtaining requisite official clearances for research projects, and creating both international

policy documents and diplomatic correspondence on behalf of Smithsonian programs.

Office of Publications Exchange

The Office of Publications Exchange (OPE) (formerly the International Exchange Service) also reports to the directorate. Its function is to foster international scholarly interchange by enabling universities and learned societies in the United States to exchange their publications with those of corresponding institutions and governments of other countries. Founded by the Smithsonian's first Secretary, Joseph Henry, OPE functions today as one of the oldest entities with ongoing activities at the Smithsonian. During 1985, OPE handled approximately 60,000 packages from more than 138 domestic institutions for transmission abroad, and 23,000 packages from 193 foreign institutions, for distribution in this country.

Programming for the International Center

Responsibility for the International Center in the new Quadrangle Building was also transferred to the Directorate in October 1984. Through the Center the Institution seeks to accomplish certain objectives not readily achieved through existing programs. For example it will offer thematically integrated programs of exhibition, scholarly exchange, and public education, bringing to bear Smithsonian research and expertise on the explication of diverse cultures and regions of the world. Further, it will seek a means to fill a significant Institution gap in programs in Latin America and hemispheric interrelationships, for while substantial Smithsonian research actually goes on in middle and South America, it is scattered within the Institution and for the most part has low visibility. And it will develop programs to encourage regular exchanges with scholars, museum professionals in other nations, through the development of institutional relationships. In all of these activities, in keeping with the special purposes of the Quadrangle itself, the initial concentration will be on increasing contacts with and offering programs about Latin America, Africa, and Asia.

International Center thematic programs are now under development. In order to help increase American understanding of other cultures, the Center's opening programs in the spring of 1987 will focus on the culture-specific visual symbolism and forms of ritual behavior associated with the universal experience of birth. In 1988 the Center's

program will concentrate upon tropical forests and the consequences and causes of the rapid degradation of these irreplaceable world treasures. The subsequent program will concentrate on themes relating to Latin America.

Strengthening scholarly and professional exchanges through institutional linkages takes many forms, building upon existing relationships and creating new ones. Conferences, workshops, and training opportunities, both at the Smithsonian locations and in other countries, are under development in close cooperation with the bureaus. At the outset, these efforts will be largely focused on Latin America and will be coordinated with the Columbus Quincentenary planning effort. Their subject matter will range across the Smithsonian's scientific and cultural interests including tropical biology, history of science and technology, museum conservation, and others.

Columbus Quincentenary Planning

The year 1992 will mark the 500th anniversary of the landing of Columbus in the Americas. The Quincentenary Commemoration offers a unique opportunity for the Smithsonian to stimulate scholarly and public interest in the impact of the voyage on the past, present, and future cultures of the Americas. The next seven years leading to 1992 will be time to develop a thematic framework for the Institution's activities, to promote scholarly exchange, to identify significant research projects, and to develop public programming. The Directorate has been assigned responsibility for this undertaking.

Initial activity will consist of two Quincentennial planning conferences in fall of 1985. Each conference will include eight to ten South, Middle, and North American scholars from various fields and the directors of the Smithsonian bureaus and offices. Invited scholars will be asked to present brief papers on salient themes, topics, and issues from their scholarly and national perspectives which shed light on the deeper and broader meaning of the Columbus Quincentenary. The format will encourage much exchange among the visiting scholars and Smithsonian bureau directors.

The purposes of the meetings are to bring the Institution into the continuing international and national discussion of commemoration topics and to extend the intellectual depth and breadth of the Smithsonian's own internal discussion of Quincentennial planning.

MEMBERSHIP AND DEVELOPMENT

James Mck. Symington, Director

Office of Development

In addition to fulfilling its primary role of securing private funding for specific projects of the Smithsonian's bureaux and offices, the Development Office has been involved in two special capital campaigns. The Cooper-Hewitt Museum in New York City, the Smithsonian's national museum of design, is undertaking a \$23 million campaign to enlarge and renovate its quarters in the Carnegie Mansion. One half of this amount is expected to be provided in a federal appropriation, and the remaining half is being sought from individuals, corporations, and foundations. A Campaign Committee has been formed with a membership of twenty-two individuals, nine of whom are present or former members of the National Associate Board. The firm of Brakeley, John Price Jones has been engaged to advise and assist the director of Cooper-Hewitt, Lisa Taylor, and the Campaign Committee.

The National Museum of African Art has also engaged the Brakeley organization to prepare a feasibility study for a major campaign to establish an acquisition fund for the museum. The Development Office has been working closely with the museum's director, Sylvia Williams, in research and planning for this significant new undertaking.

In September, a first mailing was sent to two thousand Contributing Members of the Associates located in the northeastern and mid-Atlantic regions, suggesting the advantages to them and to the Smithsonian of participating in the Institution's Pooled Income Fund. It is hoped that there will be a substantial expression of interest on members' parts which will then be personally followed up by the Development Office on a case-by-case basis.

As a means of studying and appraising the Institution's organization for fund-raising, Cambridge Associates was asked to prepare a report for the Secretary. Reflecting the opinions and attitudes of many bureaux and offices of the Smithsonian toward the development process, the report will be the subject of review by the Secretary, his Management Committee, and all bureau and office heads. The preparation of an Institutional development brochure has been deferred, pending results of the Cambridge Associates study.

While the Office performed donor research, strategic planning, and project consultation for virtually all bureaux and offices of the Smithsonian, the following received contributions or grants in fiscal year 1985, exclusive of support from the James Smithson Society and the Women's Committee of the Smithsonian Associates, reported elsewhere in this section: National Museum of African Art, National Museum of American Art, National Museum of American History, National Air and Space

Museum, National Museum of Natural History, Freer Gallery of Art, National Zoological Park, Office of Elementary and Secondary Education, Office of Symposia and Seminars, Smithsonian Environmental Research Center, Smithsonian Institution Press, Smithsonian Tropical Research Institute, and the Resident Associate Program.

National Board of the Smithsonian Associates

Seymour H. Knox III assumed the chairmanship of the National Board at the April meeting in Fort Worth, Texas. Members of the Board have continued their assistance to the Smithsonian, becoming involved in National Associate regional events and a number of specific bureau needs.

Chairman Knox continues the National Board's association with the Smithsonian's Board of Regents by attending their meetings and reporting to the National Board on the subjects that were discussed.

New members elected to the board at the April meeting were: S. Charles Kemp (Jackson, Mississippi), Thomas M. Keresey (Palm Beach, Florida), Jack S. Parker (Carefree, Arizona), Charles W. Schmidt (Wayland, Massachusetts), John C. Whitehead (Washington, D.C.), and J. Tylee Wilson (Winston-Salem, North Carolina).

At the spring meeting in Fort Worth, two new formats were inaugurated: spouses were welcomed to one meeting so as to enhance the participation of the Board in the role of the Institution, in this instance the several aspects of the National Associate Program, Lectures and Seminars, Travel and Contributing Membership; second, a meeting for Board Members only at which the Secretary gave a report on important issues facing the Institution, and affording the Board an opportunity to discuss areas of their interest. The same meeting format was successfully followed at the autumn 1985 meetings in Washington where Board members and spouses enjoyed presentations on *Smithsonian* magazine and the National Zoological Park. The next day, Secretary Adams reported to Board members on various Smithsonian endeavors and plans for the future.

Women's Committee of the Smithsonian Associates

The sixty-five active and fifty-seven resource members of the Women's Committee of the Smithsonian Associates continued to advance the interests of the Smithsonian through fund-raising, special projects, and hospitality on a volunteer basis. The members of the Committee gave over 7,600 hours of their time to the Smithsonian in fiscal year 1985. The Committee awarded \$52,700 to twenty-nine projects in twelve museums and bureaus. These monies were the net proceeds made available by the 1984 Christmas Dance and the 1984 Washington Craft Show. Projects were supported in amounts from \$200 to \$4000.

The National Museum of Natural History received funds for: reinventorying and computerizing the Cushman Library, an x-ray diffraction camera for the Department of Mineral Sciences, manuscript conservation and restoration funds for papers from Islamic people of Southern Philippines in the Department of Anthropology, docent education, a computer writing system for use by scientists, reproduction of rare slides of Bromeliads taken by Lyman Smith, cataloging over 6,000,000 specimens in the Department of Entomology, and a publication on the development and setup of a Discovery Room.

The National Air and Space Museum was given support for an oral history taken from Dr. Reisig on the history and development of rocketry and for a school program on comets. The National Museum of American History received funds for: a black American Culture package consisting of interviews and documentation of musicians over seventy years of age, a musical instrument videodisk, mannequins accurately postured for the period and docent education. The National Zoological Park received funding for: a platform scale in the Handrearing Department, a computer for the Education Department, continued support for graduate student stipends in the reproductive physiology program, and video equipment for the Department of Herpetology. The Conservation and Research Center in Front Royal received a low-light intensity camera to observe the behavior of nocturnal endangered species. The Astrophysical Observatory was able to purchase films and the Tropical Research Center developed a nature trail on the Barro Colorado Island through assistance from the Committee.

One hundred artists from twenty-eight states and the District of Columbia participated in the third annual Washington Craft Show held April 26-28, 1985, in the Departmental Auditorium. The artists were selected by five jurors: Elizabeth Broun, chief curator and assistant director, National Museum of American Art; Marc Goldring, leather artist and project director, National Crafts Planning Board; Ken Ferguson, ceramic artist and

head of the Crafts Department at Kansas City Art Institute; Ivy Ross, jewelry designer; and Lia Cook, fiber artist and professor, California College of Arts and Crafts, Oakland. Over 10,000 people attended the show, and sales were up substantially, over 25 percent more than the previous year. As in the past, a preview fund-raising party was held on April 26. A silent auction, organized by the resource members of the Committee, was held at the Departmental Auditorium concurrently with the Craft Show. A High School Craft Competition for the District of Columbia and six surrounding school districts was held to recognize quality student work and offer young artists contact with some of the country's finest artists. Additionally, an all-day fiber seminar was sponsored by the Resident Associate Program and the James Renwick Collectors Alliance.

In November, three members of the Women's Committee generously opened their homes to ninety Contributing Members visiting Washington for a special behind-the-scenes Smithsonian tour.

The James Smithsonian Society was founded in 1977 as the highest level of the Contributing Membership of the Smithsonian Associates. Since then, the Society has granted more than \$1,500,000 in support of Smithsonian projects and acquisitions. This year, through the contributions of Annual Members, the Society made awards totaling \$235,000 to the following: The Office of Symposia and Seminars for partial support of the symposium, "The Iconography and Technology of the Statue of Liberty" at the Cooper-Hewitt Museum; the Smithsonian Institution Traveling Exhibition Service toward the initial planning of an exhibition on the destruction of the world's rainforests; the National Museum of Natural History to contribute toward a film on volcanism and its observation in Hawaii; the Smithsonian Astrophysical Observatory to establish a public service program for Halley's Comet; the National Zoological Park toward the development of educational graphics for a new butterfly program; the National Air and Space Museum toward the construction and operation of a "Mission Control Center" for the two round-the-world unrefueled flights scheduled for fall 1985; the Cooper-Hewitt Museum toward a matching challenge grant for renovation and construction; the Hirshhorn Museum and Sculpture Garden to acquire *Inside "Ohio Prospect Bones"* 3.14.85, a painting by Robert Stackhouse; the National Museum of African Art toward the acquisition of a Yoruba (Nigeria) ivory carving; the National Museum of American History, in cooperation with several bureaux, to plan a radio series and produce a pilot program on American music performances at the Smithsonian; and to the National Portrait Gallery, support toward the acquisition of a portrait by Thomas Eakins.

The annual weekend for members of the Society, held every year in conjunction with the autumn meeting of the National Board of the Smithsonian Associates took place September 27-28. At a formal dinner held at the National Portrait Gallery, National Board Chairman Seymour H. Knox III announced the 1985 Smithsonian Society grants and presented the Society's Founder Medal posthumously to Earl S. Tupper. A substantial gift from the Tupper family made possible the construction of the Earl S. Tupper Research and Conference Center at the Smithsonian Tropical Research Institute in Panama. On the morning of September 28, spouses of the National Board and Smithsonian Society members participated in a musical tour of the National Museum of American History. Following the tour, Smithsonian Society and National Board members visited the Quadrangle complex and had a luncheon in their honor at the Commons.

Smithsonian National Associate Program

Since its inception in 1970, the Smithsonian National Associate Program, in cooperation with other Smithsonian bureaus, has provided innovative educational opportunities for Smithsonian Associates throughout the nation. Through *Smithsonian* magazine, members join activities which increase their awareness of the Institution and encourage support for its work.

The three units which comprise the National Associate Program, now serving more than two million members, offer benefits to Associates in a variety of ways, all of which are directed toward increasing members' personal involvement with the life of the Smithsonian.

Contributing Membership Program

The Contributing Membership of the National Associate Program provides unrestricted funds for Smithsonian research, education, and outreach programs through six levels of annual membership: Supporting (\$50), available only to members living outside the greater Washington, D.C., metropolitan area; Donor (\$100); Sponsoring (\$250); Sustaining (\$500); Patron (\$1,000); and the James Smithson Society (\$1,500).

The membership has grown steadily since the program's establishment in 1976. It numbers 32,500 at the end of 1985 fiscal year, up 15 percent from 1984. Income from membership dues, responses to special appeals, and corporate matching funds amounted to \$3,300,000 in 1985, an 18 percent increase over the previous year. Approximately 86 percent of Contributing Members reside outside the greater Washington, D.C., metropolitan area.

Nine special events were organized for members during the year, including a special viewing of the exhibition *Aditi: A Celebration of Life*; a courtyard reception and open house at the National Museum of American Art to view three special exhibitions; a premiere of the new IMAX film, *The Dream Is Alive* at the National Air and Space Museum; and a brass band concert and picnic at the National Bandstand at the National Museum of American History. Upper-level donors were invited to Collectors' Tours and receptions at the Folger Shakespeare Library and at Decatur House, an Eighteenth-century property of the National Trust for Historic Preservation.

The program endeavors not only to provide attractive books and catalogs as benefits for its members, but also to assist other SI bureaus with their publications. In addition to the Smithsonian Engagement Calendar sent each fall to all members, 1985 complimentary publications were *Drawn from Nature: The Botanical Art of Joseph Prestele*

and *His Sons*, also published by the Smithsonian Institution Press, and *Aditi: The Living Arts of India*, also published by the Press to accompany the exhibition which constituted one of the major Smithsonian contributions to the nationwide festival of India. Because of the press run the program can guarantee, bureaus are able to have a better publication at a significantly lower price.

For Contributing Members living within the greater Washington, D.C. area, the program pays annual dues to the Resident Associate Program, helping to support its monthly newsletter and classes. Members outside this area receive "Research Reports," published three times a year by the Office of Public Affairs to highlight special research and educational projects underway throughout the Institution.

"Smithsonian Treasures," a behind-the-scenes tour of the Institution designed by the Associates Travel Program for Contributing Members exclusively, continues to meet very positive response. During the course of Lecture and Seminar Programs in communities nationwide, Contributing Members are offered complimentary tickets to one lecture and often an invitation to an informal gathering planned in conjunction with the lecture. Such special treatment reinforces the message that these members are important to the Smithsonian and forwards the development of a loyal national constituency that will be responsive to other specific Smithsonian fundraising efforts.

The Lecture and Seminar Program

The National Associates Lecture and Seminar Program, formerly the Regional Events Program and the Selected Studies Program, continues to share the educational resources of the Smithsonian with Associates and the general public who live outside Washington, D.C. Now in its tenth year, the Lecture and Seminar Program has made it possible for Smithsonian scientists, curators, and fellows to travel to more than 100 cities. Through lectures, seminars, and musical presentations, these Smithsonian scholars offer Americans throughout the country a unique opportunity to learn about the research and activities of their national museum.

Museums, other cultural organizations, colleges, and universities in host cities throughout the country are local cosponsors for Smithsonian Events. Many local hotels provide in-kind services as corporate cosponsors. The national organizations that continue to lend support to the Lecture and Seminar Program are: The Institute of Lifetime Learning of the American Association of Retired Per-

sons, the EAA Aviation Foundation, Sigma Xi, the Scientific Research Society, the National Trust for Historic Preservation, the World Wildlife Fund-U.S., and United Airlines.

During 1985, the Lecture and Seminar Program cooperated with 87 local and six national organizations to produce 169 Smithsonian Events in eighteen host cities—Bozeman and Missoula, Montana; Austin, Texas; Oakland, Berkeley, Sacramento, Davis, and Santa Barbara, California; Honolulu, Hawaii; Omaha and Lincoln, Nebraska; Charleston, South Carolina; Phoenix, Arizona; Las Vegas and Overton, Nevada; Savannah, Georgia; Portland, Maine; and Springfield, Massachusetts.

One hundred twenty-seven feature articles about Smithsonian Events were carried in newspapers and magazines nationwide. Smithsonian speakers were heard in forty-eight radio and television interviews throughout the country.

Each year, the Lecture and Seminar Program introduces new events and formats to highlight current research interests of the Smithsonian and of the local cosponsoring institutions. Lectures for 1985 included "American Costume: Men and Women Dressing the Part" by Claudia Kidwell, NMAH; "American Art at the Smithsonian" by Charles Eldredge, director of NMAA; "Bamboos of the World" by Thomas Soderstrom, NMNH; and "More than Meets the Eye: Exploring Microspace" by Jeffrey Post, NMNH.

In response to growing enthusiasm among Associates, the Lecture and Seminar Program introduced two-to-five-day seminars. Among these special extended seminars were "Life in the Ocean Depths" by Clyde Roper and David Pawson, NMNH; "Creative Writing" by *Smithsonian* Magazine Editor Edwards Park, and "Man's Quest for Wings: Highlights of Aviation History" by E. T. Wooldridge, Claudia Oakes, and Thomas Crouch, NASM.

The first international program highlighted this tour season. In May of this year, an entourage of ten Smithsonian speakers, including Secretary Adams, traveled to Tokyo, Japan, to share their knowledge and expertise with the Japanese and American public and Smithsonian Associates living in Japan. This lecture series was made possible by MYC Cultural Exchange Institute, a private, nonprofit cultural organization based in Tokyo, with the cooperation of the American Embassy, Tokyo American Club, the American Chamber of Commerce, and The America-Japan Society. A gala reception was held on May 15 to honor Smithsonian delegates and included remarks by Secretary Adams, a welcome by Shintaro Abe, Foreign Minister of Japan, and comments by Tadao Ishikawa,

President of Keio University. In addition, Smithsonian scientists and curators gave presentations at four American schools and met with colleagues to discuss research projects. The Tokyo series was met with highly enthusiastic response from both the Japanese and American audiences and generated a great deal of interest in future programs for scholarly and cultural interchange.

In addition to events offered in cities throughout the United States and abroad, the Lecture and Seminar Program also designs intensive, week-long seminars for National Associates who wish to expand their educational horizons in Washington, D.C. These seminars, held in Smithsonian museums and research facilities, are presented by Smithsonian curators and scholars. "Animal Communication: Classic Studies and New Discoveries" was conducted by specialists at the National Zoological Park and "Aircraft Restoration" enabled participants to get a firsthand glimpse of some of the restoration activities at the National Air and Space Museum's Paul E. Garber Facility.

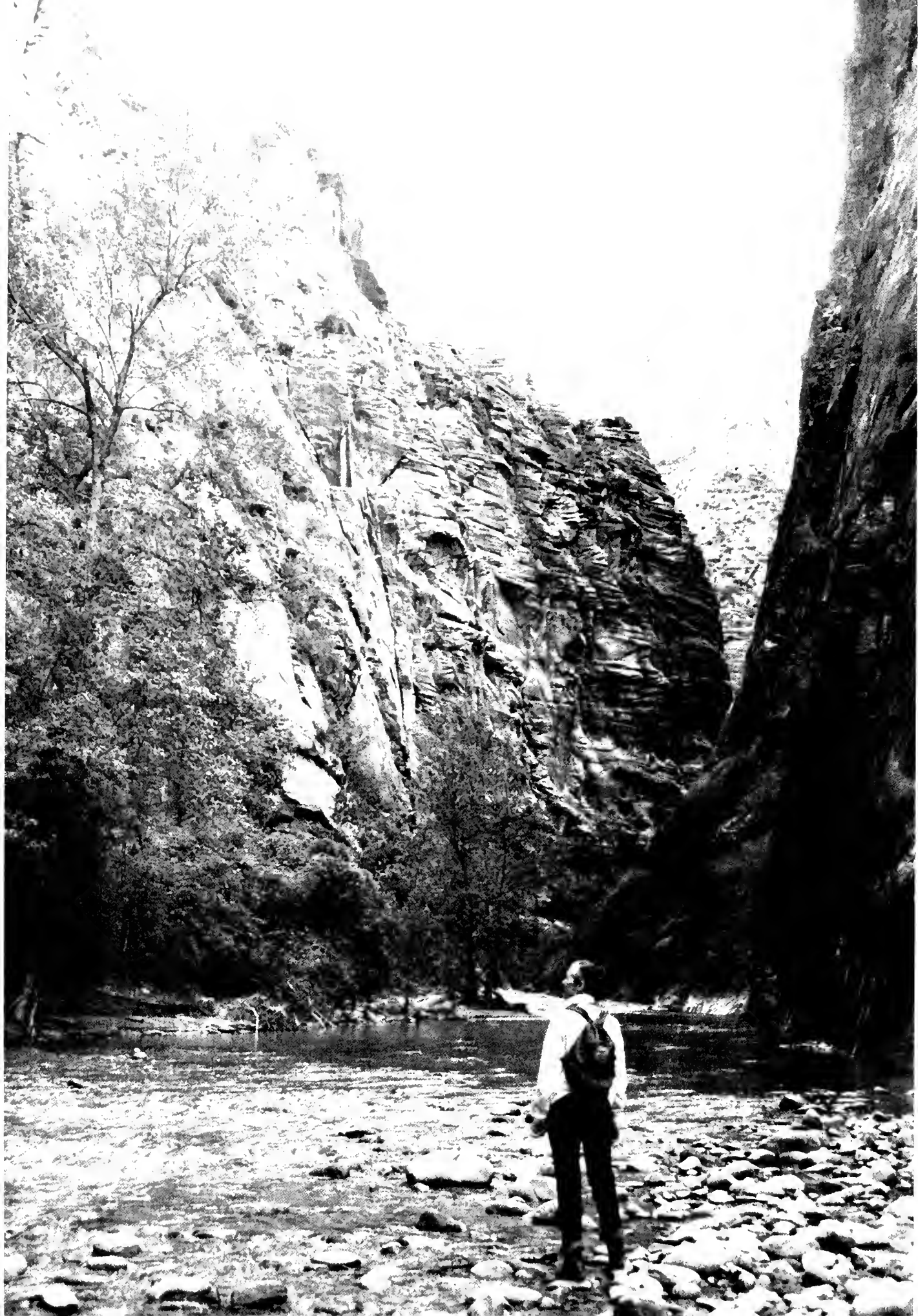
The Lecture and Seminar Program launched a science education project with the National Museum of Natural History's Office of Education. This joint effort provides workshops for science teachers and museum educators to develop innovative methods of teaching science.

Associates Travel Program

The Associates Travel Program presents educational study tours that mirror the interests and concerns of the Institution. Tours are designed for members who are particularly interested in the work of the national museum and the subjects in *Smithsonian* magazine. The educational content of both foreign and domestic tours is enhanced by study leaders; each trip is led by one or more Smithsonian staff. Since 1975, more than 54,000 Associates have participated in study tours throughout the world; in 1985, 4,000 members traveled on ninety-five tours.

In 1985, Associates chose from forty-one Domestic Study Tours—to all parts of the United States—to experience firsthand the natural wonders and regional heritage of America. Three ships were chartered exclusively for Smithsonian Associates to explore our American waters. The historic steamboat *Delta Queen* steamed up the Mississippi re-creating the life of a bygone era. On the Ches-

Smithsonian Associates in Zion National Park, Utah, hike the Gateway-to-the-Narrows Trail at the foot of sandstone walls that rise 2,000 feet above the Virgin River.



peake Bay Cruise, Associates visited centers of the crab and oyster industry and toured historic homes and museums from Baltimore to Williamsburg. Other members cruised Alaska's famed Inside Passage.

New programs took place in Chicago and Los Angeles. Here Associates learned about architecture, history, and current cultural trends. A weekend program of opera in New York City featured guest performers, backstage tours, and selected performances. Crafts, antiques, and historic homes highlighted a summer tour of Vermont's green mountains.

Associates continue to seek the adventure and wonder of the out-of-doors. Three new natural history programs took place in Maine, Oregon, and Atlanta, Georgia. For a hands-on experience, Associates joined archaeologists in Cortez, Colorado, to dig for artifacts at an Anasazi Indian site. David Steadman (NMNH) led a camping trip to the Hawaiian Islands where he was conducting research on bird fossils.

More than 3,000 Associates participated in the "Washington Anytime Weekend," designed to give members an opportunity to visit the nation's capital and the Smithsonian any weekend during the year. The program is executed in cooperation with the Visitor Information and Associates' Reception Center, which provides a behind-the-scenes tour of the Castle and is available for information and guidance during the weekend.

Foreign Study Tours continued to serve the diverse interests of Associates by offering a wide variety of activities and destinations. Two very successful holiday programs, "Christmas in Canterbury" and "Christmas in Austria," enabled Associates to join local residents in traditional holiday observances, attend the theater, and enjoy the ambience and festive spirit of an old-fashioned Christmas.

Natural history programs included a new tour to Ireland where Associates stayed in castles and inns and took day hikes along the southwest coast. A wildlife safari to India and Nepal included excursions on elephant back to observe many species of wildlife. This year two New Zealand study tours were offered. Some members followed a cultural itinerary on the North and South Islands, while others hiked the famous thirty-three-mile Milford Track. Associates explored the north central Highlands of Scotland and the offshore islands of Handa and Skye on a program cosponsored for the seventh consecutive year by the Aigas Field Centre.

Clyde Roper (NMNH) led the fourth annual Atlantic Crossing, discussing marine biology and maritime history while sailing from Spain to the Caribbean aboard the four-masted barque *Sea Cloud*. Associates traveled on the

Danube from Romania through Bulgaria, Yugoslavia, Hungary, Czechoslovakia, Austria, and Germany studying the history and culture of the area. David Steadman (NMNH) led a new study voyage to the South Pacific where he lectured on the natural history of Fiji, Samoa, the Cook Islands, Bora Bora, and Tahiti. Other study voyages focused on art and architecture on the Iberian Peninsula and the southern coast of France, Viking history from Scotland through the fjords of Norway, and the natural and cultural history of Indonesia.

China continued to lure members who traveled on thirteen tours following seven different itineraries. The Tibet study tours were in great demand, as were "Decorative Arts and Antiques" and "China by Train." In addition to China, train buffs traveled through India aboard the historic train of the maharajas, crossed the Soviet Union on the Trans-Siberian Express, and experienced a variety of train travel on "Europe by Train" including France's TGV and the Orient Express.

Countryside programs allowed Associates to live in small towns in England, France, Austria, and Switzerland. Residential seminars included music history in Salzburg, Japanese language and culture in Kyoto, history and art in Florence, and the seventh annual Oxford/Smithsonian Seminar which offered a choice of specially designed courses in the arts and sciences.

The Smithsonian National Associate Program continues to increase services to its members as it encourages private support for the Institution. Inherent in the approach of the program is an emphasis on four themes: educational pursuits, member participation, public awareness, and cooperation with Smithsonian bureaus and like-minded organizations nationwide.

Smithsonian Resident Associate Program

The Smithsonian Resident Associate Program (RAP)—the private, cultural, continuing education, membership, and outreach arm of the Smithsonian Institution for metropolitan Washington—is a model for museum membership and educational programs nationally and internationally. It draws membership from the District of Columbia, Northern Virginia, and Maryland. This year membership was 55,000 with retention at 80 percent.

During fiscal year 1985, over 1,900 activities—many with multiple sections—were attended by more than 279,550 persons, an increase over the previous year. Hundreds of thousands more persons heard and/or saw courses through audio-bridge or television broadcasts.

Self-supporting and income-producing, except for Discovery Theater and performing arts, with occasional small grants to help fund special outreach projects, the program reimburses the Institution for office space rental, computer and audio-visual support, labor, and administrative support.

Cooperation with Smithsonian Bureaus

A primary focus of the program continues to be planning activities that enhance appreciation of Smithsonian resources. Quarterly planning meetings with Smithsonian Institution curators lead to the organization of a variety of activities that disseminate the mission of the Institution. In fiscal year 1985, the Resident Associate Program conducted activities in connection with all major exhibitions, as well as special collections and curatorial expertise. In addition, the program and some Smithsonian museums cosponsor annual series: "Portraits in Motion Showcase" performances with the National Portrait Gallery; Twentieth Century Consort concerts and regular lectures with the Hirshhorn Museum and Sculpture Garden; the multifaceted Smithsonian chamber music programs with the National Museum of American History; and concerts in the Albert Einstein Planetarium with the National Air and Space Museum. Programmatic cooperation with the Smithsonian Institution Traveling Exhibition Service and staff participation as lecturers in Office of Museum Programs workshops are ongoing. Courses are regularly planned in collaboration with the Woodrow Wilson International Center for Scholars.

Outreach

Through scholarships, special interest projects, and collaboration with civic institutions, the Resident Associate Program expands its accessibility.

Discover Graphics, a free program, provides talented area high school students and their teachers with opportunities to study etching and lithography on fine Smithsonian presses. Over 200 public secondary school students and their art teachers received studio training, combined with Smithsonian study visits. A student exhibition of selection prints, juried by Smithsonian curators, was held at the National Museum of American History, summer 1985.

Scholarships were awarded to inner city young people and adults to attend Young Associate and adult courses. This year 141 adult scholarships, and 77 scholarships for young people were awarded.

The nineteenth annual kite festival open to members and the general public took place on the Mall in March.

Tuesday Mornings at the Smithsonian is the daytime weekly lecture series specifically designed to engage the interest of retired citizens. Thirty-six lectures, each attracting between 250 and 400 persons, are presented annually by Smithsonian scholars. This year a total of 11,300 attended. Programs for working singles were initiated this year and will be further emphasized in fiscal year 1986.

Collaboration with Community, Regional, National, and International Organizations

For the twelfth consecutive year, the Resident Associate Program cosponsored nine monthly lectures with the Audubon Naturalist Society and the Friends of the National Zoo. This year's series attracted more than 11,000 persons. The program continues to collaborate with organizations such as the American Institute of Architects and the AIA Foundation, the Washington-Alexandria Center for Architecture, Virginia Polytechnic Institute and State University, the Pennsylvania Avenue Development Corporation, District of Columbia Downtown Partnership, the Office of the Mayor, the Art Directors Club of Metropolitan Washington, the Federal Design Council, and the American Institute of Graphic Arts, Washington Chapter.

The Resident Associate Program received three awards from the National University Continuing Education Association: two regional for excellence in programming, and one national for creative marketing.

Many lectures, courses, films, and performances were planned in collaboration with foreign embassies and inter-



Indian musician Ravi Shankar plays the sitar in concert at the Baird Auditorium in June 1985 as part of the opening of the year-long Festival of India at the Smithsonian and around the nation. (Photograph by Robert de Milt)

national societies, including the courses, “Saudi Arabia: Tradition and Change”; “The Classic Japanese Theater: No, Bunraku, Kabuki”; and “Great Britain and the World—Contemporary Perspectives.”

The Resident Associate Program responded to the national celebration of the Festival of India, with a rich selection of activities. Highlights included the performance of world famous sitarist Ravi Shankar; a course “The Discerning Traveler in India: Ancient Civilization and New Hope”; and a lecture by Rajeev Sethi, curator of *Aditi: A Celebration of Life*.

Telecommunications

The Resident Association Program is committed to the use of the latest telecommunications technology and its applications for outreach. During fiscal year 1985 two courses were videotaped—“Living and Working in Space: The Final Frontier” and “The Ascendancy Asia: The Pacific Community in the 21st Century.” The latter was developed in cooperation with the Woodrow Wilson International Center for Scholars Asia Program and the Asia Founda-

tion. After editing, the tapes are to be distributed in Asia by the Asia Foundation and in the United States by the Resident Associate Program.

Collaboration also began with the United States Information Agency’s WORLDNET, an international, interactive video broadcasting service. Selected Resident Associate activities are to be broadcast by satellite to Europe commencing in September 1985 and will be seen at United States embassies.

Programs

Courses

The curriculum of arts, sciences, humanities, and studio arts for educated adults—offered four terms per year—provides opportunities for serious study with Smithsonian and visiting scholars. In 1984–85, 181 lecture courses were scheduled, and attendance reached 58,600. Among the most popular were “Opulence and Illusion: Masters of Fashion Photography” and “The Tellers of Tales: The Art of Traditional Storytelling,” coordinated by Smithsonian’s Oscar-winning Marjorie Hunt; “Conflict and Peacemaking in the Middle East: Strategic Issues,” developed with the cooperation of Wilson Center experts; and “The Television Age: News and Reality,” featuring eminent broadcast journalists. Computer courses and foreign language courses expanded successfully.

The studio arts program enhances appreciation of age-old crafts, keeping alive techniques now rapidly disappearing from the modern world, and introduces contemporary arts and crafts. In all, 240 courses and workshops were presented, with an attendance of nearly 13,800.

Lectures, Seminars, Films

Single lectures, intensive one- and two-day seminars, and scholarly symposia led by distinguished authorities addressed a wide range of cultural topics. Individual films and film series featuring foreign cultures, saluting well-known artists, or highlighting different techniques are an expanding feature.

Notable speakers and guest artists included Oscar nominee Adolph Caesar, archaeologist Mary Leakey, artist Judy Chicago, engineer Harold Edgerton, Pulitzer-prize winning biographer Joseph Lash, American National Theater director Peter Sellars, and Soviet mountaineer Michael Monastyrskii. More than 28,000 persons attended 92 Resident Associate Program lectures in fiscal year 1985. Eleven

intensive seminars enabled 1,200 participants to examine a rich selection of subjects in depth.

Several Washington film premieres were screened, including *Wagner*, the nine-hour epic story of the operatic genius, and *The Country Girls*, which sold out three times. Among the many successful film series sponsored during the year were a Truffaut retrospective and a showcase of East European films, launched with a reception attended by five ambassadors. Sixty-three films attracted 22,800 people.

Performing Arts

An outstanding season of music, dance, theater, and poetry was presented in RAP's second year of sponsorship of ticketed Smithsonian performing arts events. The acclaimed Emerson String Quartet series, summer outdoor concerts in the courtyard of the National Museum of American Art/National Portrait Gallery, winter brunch concerts held at the National Museum of American History, the Jazz Series, Joe Williams' tribute to Count Basie, the "Stars of the D'Oyly Carte," and dancer Meredith Monk's performance were among highlights. In the 1984-85 season, 127 performances were presented, and 34,600 attended.

Study Tours

On-site learning experiences are organized for small groups in the fields of art, architecture, archaeology, history, industry, and science, lasting from one hour to three days. Tours range in content from historic railroads to the Baltimore art scene to cruises on the Chesapeake Bay. Art and architecture continue to be among the most popular tour subjects, with specialized science tours gaining steadily. Free tours, most led by museum docents, attracted 4,900 participants during the year, and a series of tours for working singles attracted new audiences. In 1984-85, 572 tours took place, with total attendance by more than 24,800 people.

Young Associate and Family Activities

Through Young Associate and Family Activities, Smithsonian resources are introduced to young people, ages four to fifteen, and their parents and adult friends. Classes, workshops, monthly free films for families, tours, and per-

formances are tailored to their ages and interests. Innovative adult-child classes and workshops enable adults and children to learn together. Summer Camp sessions are team taught, combining talents of teachers of different disciplines. In 1984, 168 Young Associate and Family Activities attracted an attendance of more than 11,300 individuals.

Discovery Theater

Discovery Theater presents entertainment and educational experiences for young people and their families, October through June. Two performances a day were presented, Tuesday through Saturday, with extra performances during Black History Month. Learning Guides are produced by Resident Associate Program staff and furnished free to group leaders. Over 61,800 individuals attended the 354 performances during the season, a 31 percent increase over the previous season; approximately two-thirds consisted of groups from local school systems. For the first time, Discovery Theater sponsored an art and writing competition from local elementary schools, with winning works incorporated in some of the performances.

Volunteers

A total of 420 volunteers provided invaluable assistance to the program, monitoring activities, and performing vital office duties. The 72 volunteer office workers and monitors represent the equivalent of twelve full-time staff members.

Summary

Fiscal year 1985 was a thriving, ebullient year for the Resident Associate Program with high attendance, strong membership retention. The Resident Associate Program celebrated its 20th anniversary in September 1985, offering a rich selection of activities including appearances by Carl Sagan; Jehan Sadat; Melina Mercouri; Karen Akers, Daniel Duell; and May Sarton. An anniversary serigraph was created by artist Gene Davis. Many more anniversary events were planned for later in the fall. The "20 for the 20th" theme elicited many new members and major press coverage, as well as enthusiastic support from current members.

UNDER SEPARATE BOARDS
OF TRUSTEES

Reading Is Fundamental, Inc.

Mrs. Elliot Richardson, Chairman
Ruth Graves, President

Reading Is Fundamental, Inc. (RIF) is a national, non-profit organization dedicated to creating a literate American citizenry by helping communities introduce young people to books. Since its founding nearly twenty years ago as a small, inner-city reading motivation project in the District of Columbia, RIF has put more than sixty-five million books into the hands of America's young people.

Today there are 3,300 RIF projects in 10,224 sites, operating in all fifty states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Last year, RIF's network of volunteers reached more than 2.2 million young people with 7.2 million books. Sponsors of RIF projects include schools, libraries, Indian reservations, housing projects, migrant worker camps, detention halls, schools for the handicapped, service organizations, and many other nonprofit and public agencies.

To prevent today's youngsters from becoming the illiteracy statistics of tomorrow, RIF projects hold book distributions, on an average of three times a year, where children are free to choose and keep the books that interest them. Samuel Johnson once said, "A man ought to read as his inclination leads him, for what he reads as a task will do him little good." RIF's success in converting reluctant readers into booklovers underscores the truth of this adage.

RIF: A Public-Private Partnership

The *New York Times* once described the RIF program as "one of those rare examples of how the Government has joined the grass roots community and virtually everyone has wound up applauding."

RIF has been remarkably successful in mobilizing the private sector to promote literacy. More than 98,874 local citizens contribute millions of man hours to operate RIF projects; some 6,046 businesses and community organizations provide matching funds, goods, and services; 350 book suppliers offer special services and discounts (averaging forty percent) to RIF projects; and scores of foundations and corporations make generous grants.

In 1976, Congress, noting RIF's effectiveness in promoting literacy, created the Inexpensive Book Distribution Program (IBDP) and modeled it on RIF. The IBDP, which RIF operates under contract from the Department of Education, permits RIF to match with Federal funds the local funds volunteers raise to buy books.

Highlights of 1985

Among the year's activities was a series of workshops for parents made possible by a grant from the General Electric Foundation and held in cooperation with local projects in major cities across the country. Attended by approximately one thousand parents, these workshops featured presentations by experts in the field of children's literature and practical sessions on how parents can promote reading in the home.

A statewide RIF conference in Phoenix, attended by more than two hundred Arizona educators, librarians, community and business leaders, public officials, and RIF representatives, demonstrated the support RIF enjoys throughout the state. Speakers included Phoenix Mayor Terry Goddard, local author Byrd Baylor, and Dan Fader, Michigan educator and author of *Hooked on Books*.

Another of the year's highlights was a visit by Mrs. Hosni Mubarak, wife of the president of Egypt, to a RIF distribution for some six hundred Washington, D.C., area youngsters. Mrs. Mubarak has been active in promoting literacy in her own country and is particularly interested in RIF's method of getting children into books and reading.

During April, Reading Is Fun Week was again celebrated across the nation in memory of RIF's founder, Margaret McNamara. Among the special events marking this occasion was a Read-In held on the lawn of the Vice President's House. Speakers included Mrs. George Bush, RIF board member; Education Secretary William J. Bennett; and authors Pearl Bailey, Tomie dePaola, and Frank Herbert.

On the last day of RIF week, publisher and New York Mets owner Nelson Doubleday sponsored a RIF Day at Shea Stadium in New York, which was attended by 170 young people in New York area RIF projects. Mrs. Bush threw out the first ball of the game while Diamond Vision, the huge screen that shows instant replays, flashed the words "Reading Is Fundamental."

Through a grant from the National Home Library Foundation, RIF conducted a nationwide campaign to promote recreational reading, which culminated in a drawing for a National RIF Reader. Mrs. Bush, Mrs. Lynda Johnson Robb, RIF board member, and Smithsonian Secretary Robert McC. Adams were among those who drew the names of the winner and runners-up at a ceremony in the Smithsonian Castle Building. The National RIF Reader won a trip to Washington, D.C., during RIF Week and a library of books donated by publishers. It was estimated that during the two-week campaign more than a million youngsters had read a total of 285 years, four months, and twenty-one days.

On the opening day of the American Booksellers Association convention in San Francisco last May, B. Dalton Bookseller and Penguin Books cosponsored a gala RIF book distribution for some six hundred children and their four hundred parents. Youngsters were entertained by Jim Davis, who drew pictures of his famous cat Garfield, and parents attended a workshop featuring Jim Trelease, author of *The Read-Aloud Handbook*.

In 1985, the New York-based advertising agency the Al Paul Lefton Company scripted, directed, and filmed a series of RIF public service announcements (PSAs), featuring the talents of Michael Warren and Charles Haid (better known as Hill and Renko on NBC TV's "Hill Street Blues"). Both agency and actors volunteered their time to RIF. Since RIF was approved by the Advertising Council as a public service organization fourteen years ago, more than \$35 million worth of free time on radio and television stations and in print media has been donated to RIF.

Of special note are the many ways corporations, foundations, and publishers have found to benefit RIF. A manufacturer of children's clothing, General Sportswear, for example, arranged to donate twenty-five cents to RIF for each entry in a children's modeling contest. Waldenbooks held a golf and tennis RIF benefit in which 144 golfers and 64 tennis players, all from the publishing community, participated. In 1985, New York Life Foundation established a grant to bring books to some 9,000 Native American young people in nine states, many in economically depressed areas. And New American Library (NAL), to mark the twenty-fifth anniversary of its Signet Classic imprint, earmarked one cent to RIF for each Signet Classic sold in 1984 and encouraged retailers to do the same by agreeing to match each penny donated with an additional penny.

Summary

Today we are witnessing a rise in both illiteracy and aliteracy (the disinclination to read by those who have the skill). But the increase in bookless homes foreseen in George Orwell's *1984* can be averted. Through RIF, youngsters have ready access to a variety of books and parents are becoming involved in their children's reading.

A recent report on reading issued by a National Institute of Education (NIE) commission draws many conclusions that corroborate the effectiveness of RIF's method of encouraging reading. The commission states that "Reading itself is fun . . . An essential step in reaching that goal (of literacy) is to provide children with ready access to



Mrs. Hosni Mubarak, wife of the president of Egypt, talks with children about books during a RIF distribution in southeast Washington, D.C. (Photograph by Rick Reinhard)

books that are interesting to them." The NIE report emphasizes books in the home, parental involvement, and reading often, and for pleasure.

Public demand for the RIF program has never been greater. In the last year RIF has been forced to turn away more than one thousand groups for lack of book funds. A key priority for the coming year will be to expand RIF's outreach and to devise ways to assure that America's children grow up reading.

Woodrow Wilson International Center for Scholars

James H. Billington, Director

The Wilson Center—with the Kennedy Center for the Performing Arts and the National Gallery of Art—is one of three institutions with mixed trust/public funding created by the Congress within the Smithsonian Institution in Washington, D.C., fulfilling a national mission under a board appointed by the President of the United States. The Wilson Center is an active workshop and switchboard for scholarship at the highest levels. Since its opening fifteen years ago this fall, it has gained widespread recognition for the work of its fellows in mining the scholarly riches of Washington, for its many meetings that bring together the world of affairs and the world of ideas, and for its democratic openness to all comers through its annual fellowship competition.

Each year, some fifty fellows are brought in through open international competition involving ever-increasing numbers of applicants from a wide range of backgrounds, disciplines, cultures, and nations. A broad spectrum of ideas is, in turn, shared with a nonspecialized national audience through *The Wilson Quarterly*, which has more subscribers than any other scholarly quarterly journal in the English-speaking world.

The Wilson Center seeks to render a service to the world and to the Washington, D.C., community by throwing open its core fellowship program to all interested individuals. Fellows are selected for the promise, importance, and appropriateness of their projects on the recommendation of broadly based academic panels outside the center. The fellows come for limited periods of study in the broadly inclusive program on History, Culture, and Society, as well as in special programs for research on Russia and the Soviet Union (the Kennan Institute for Advanced Russian Studies), Latin America, international security, Asia, American society and politics, Eastern Europe, and Western Europe. Each program is directed by a scholar on the staff.

In keeping with its mandate to symbolize and strengthen the fruitful relations between the worlds of learning and public affairs, the center sponsors conferences and seminars on topics of special current interest to both worlds. In 1985 it brought together scholars from diverse disciplines, members of Congress, representatives of the executive branch, businessmen, journalists, military experts, writers, politicians, educators, and diplomats to consider a variety of issues, examine current questions, celebrate major events, and participate in evaluative discussions.

Increasingly, people from different regions of the United States meet and interact with foreign scholars and members of Washington's growing intellectual community. From late September 1984 to May 1985, the center spon-

sored five major conferences in cooperation with the Ditchley Foundations of the United Kingdom on "The United States, Britain, and Europe: Changed Relationships in a Changing World." Alternating venue between The Wilson Center and Ditchley Park, outside Oxford, conferees examined such issues as the Anglo-American alliance since 1945, decolonization and independence in the Third World, the future of East-West relations, strategic interests and arms control, and transatlantic approaches to world economic problems.

Participants in the Ditchley/Wilson Center series included Lord Beloff, professor of government and public administration emeritus at Oxford University; Roger Louis, professor of English history and culture at the University of Texas at Austin; Lord Saint Brides, former British High Commissioner in Pakistan and India; Sir Harold Beeley, former assistant undersecretary in the British Foreign and Commonwealth Office; Roderick MacFarquhar, professor of Chinese studies at Harvard and a former fellow of The Wilson Center; A.P. Thornton, professor of history at the University of Toronto; Robert Rotberg, professor of political science and history at MIT; Prosser Gifford, deputy director of The Wilson Center; George C. McGhee, former ambassador of the United States to the Federal Republic of Germany; Robert F. Goheen, former ambassador of the United States to India; Sir Michael Paliser, former permanent undersecretary of state in the British Foreign and Commonwealth Office; Elliot Richardson, senior resident partner at Milbank, Tweed, Hadley and McCloy; Sir James Eberle, director of the Royal Institute of International Affairs; Richard Gardner, professor of law and international organizations at Columbia University Law School; Sidney Jones, undersecretary of commerce for economic policy; and David Reynolds, director of studies in history at Christ's College, Cambridge University.

The center's Kennan Institute sponsored a dinner March 6 for a delegation from the Supreme Soviet of the USSR, which was on a visit to the United States after a similar delegation from the U.S. Congress had traveled to the Soviet Union. Joining members of the delegation, headed by Politburo member Vladimir V. Scherbitsky, was a congressional contingent that included Representatives Thomas Downey, Thomas S. Foley, Richard Gephardt, David Obey, Timothy Wirth, Henry Waxman, and Sidney Yates. Among other participants at the dinner were George F. Kennan, former ambassador of the United States to the USSR; Anatoly Dobrynin, ambassador of the USSR to the United States; David Hamburg, president of the Carnegie Corporation; Donald M. Kendall, president of PepsiCo Inc.; and Ted Turner, president of Turner Broadcasting.



Elliot Richardson, former ambassador and Wilson Center fellow, presides at the concluding session of a conference at the Wilson Center on "The United States, Britain, and Europe: Changed Relationships in a Changing World." To his left is Prosser Gifford, Wilson Center deputy director; to his right, Richard Portes, professor of economics at the University of London.

In cooperation with the National Organization on Disability, The Wilson Center sponsored a mid-September meeting with U.N. Secretary-General Javier Pérez de Cuéllar, who expressed the hope that the world in the year 2000 would show "universal respect" for the disabled, would put their skills and talents to good use, and would "substantially reduce" the causes of disability that are "subject to human control." Others who spoke that afternoon were Margaret Heckler, secretary of health and human services and a member of the Wilson Center board; Frederick Robbins, president of the National Academy of Medicine; Karl Deutsch, professor of international peace at Harvard; pollster George Gallup; Alan Reich, president of the National Organization on Disability; James Roosevelt, Jr., of the Warm Springs Foundation; and Marcela Pérez de Cuéllar, honorary chairperson of the World Committee for the U.N. Decade of Disabled Persons.

Culminating the fiscal year was a three-day conference on "Spain in the 1980s: The Domestic Transition and a Changing International Role." Cosponsored by the Instituto de Cooperación Iberoamericano of Madrid and the Wilson Center's West European Program, the event examined the significance of Spain's decade-long transition to parliamentary democracy. Not only is Spain seeking a bigger role in the European and North Atlantic communities

of nations, but states in Latin America and elsewhere are beginning to take a hard look at the Spanish record for clues to effecting such a transition. Among the participants and discussants were William J. Bennett, U.S. secretary of education; John Brademas, president of New York University; Raymond Carr, warden of St. Antony's College, Oxford University; Filipe González, prime minister of Spain; Richard Lugar, chairman of the U.S. Senate Committee on Foreign Relations; José Maria Maravall, Spain's minister of education and science; Carlos Andrés Pérez, former president of Venezuela; Arturo Rivera y Damas, archbishop of San Salvador; José Pedro Pérez Llorca, former foreign minister of Spain; and Xavier Rubert de Ventos, a member of the Spanish Congress of Deputies.

In addition to these large conferences and major events in 1985, the center sponsored a number of more informal discussions that brought together statesmen and scholars. At one such meeting in early May, Saburo Okita, a former Wilson Center fellow and former foreign minister of Japan, discussed U.S.-Japanese relations in light of new measures by the Japanese government to ease access to foreign goods.

The center's fellows continued to come from all over the world, from many disciplines, and from many areas of the United States. Among its 1985 fellows were Lawrence Lipking, professor of humanities at Northwestern; Claude Ake, dean of social sciences at the University of Port Harcourt in Nigeria; Jacquelyn Hall, director of the Southern Oral History Program at the University of North Carolina at Chapel Hill; Indian columnist and author Rajmohan Gandhi; Istvan Deak, professor of history at Columbia; Rashid Khalidi, associate professor of political science at the American University of Beirut; Bohdan Bociurkiw, professor of political science at Carleton University in Ottawa; and Gerhard Wettig, deputy head of foreign policy research at the Federal Institute for Eastern and International Affairs in Cologne.

The result of this broad and heterogeneous mix of fellows is an intellectual life greater than the sum of its parts: the collegial atmosphere provides an opportunity for learning and communication that transcends national and academic boundaries for the benefit of all.

The John F. Kennedy Center for the Performing Arts

Roger L. Stevens, Chairman

The John F. Kennedy Center for the Performing Arts, organized by an Act of Congress in 1958 as a self-sustaining bureau of the Smithsonian Institution, is both a presidential memorial under the aegis of the Department of the Interior and a performing arts center directed by a board of trustees whose citizen members are appointed by the President of the United States. Six congressional representatives and nine designated ex-officio representatives of the executive branch complete the membership of forty-five. This annual report of the Kennedy Center's activities encompasses all the programming presented in its five theaters.

Unlike many regional performing arts centers, the Kennedy Center, as the national cultural center, is specifically directed by its authorizing legislation to develop and present a broad array of performing arts programming, including theater, music, opera, ballet, and dance. The Kennedy Center must also sponsor educational and public service activities in Washington and across the country in order to provide the broadest possible public access. The Kennedy Center annually seeks millions of dollars in private contributions in order to meet its performing arts programming goals since no direct federal appropriations are provided to fulfill this congressional mandate. This year, however, an endowment campaign has been launched in order to financially secure the center's future. The endowment will make possible longer-range artistic programming to help ensure the high quality of that programming.

The Kennedy Center's commitment to creating and presenting outstanding productions and the world's finest artists resulted in many programs of great distinction this year. The Royal Shakespeare Company performed *Much Ado About Nothing* and *Cyrano de Bergerac* in the Opera House. Major ballet premieres were given by the American Ballet Theatre, the Joffrey Ballet, San Francisco Ballet, Ballet West, and Dance Theatre of Harlem. The American National Theater—jointly established last year in its logical home, the national cultural center, by the Kennedy Center and the American National Theater and Academy—presented its charter season in 1985. It included a landmark revival of Eugene O'Neill's *The Iceman Cometh* and a monumental production of the rarely staged epic *The Count of Monte Cristo*. And, with the AT&T Performing Arts Festival at the Kennedy Center, AT&T broke new ground in the field of corporate support of the arts when it sponsored American National Theater's "Chicago Season"—four plays from the Wisdom Bridge and Steppenwolf theaters, two of which were free to the public.

Performing Arts Programming

The 1984–85 season at Kennedy Center was attended by 1,189,185 people in the Opera House, Concert Hall, Eisenhower, and Terrace theaters. Programming highlights are described in the sections that follow.

Drama and Musical Theater

The theatrical season at the Kennedy Center illustrated the vitality and excellence of theater all across America and around the world.

On the international level, Great Britain's Royal Shakespeare Company presented two glorious productions in repertory in the Opera House—Shakespeare's *Much Ado About Nothing* and Rostand's *Cyrano de Bergerac*, both starring Derek Jacobi and Sinead Cusack. From Japan, the monumental Grand Kabuki brought the largest troupe ever to perform in America—ninety-one actors, including two Living National Treasures—to perform several classics of the Japanese stage. As part of the National Festival of India, a week of "The India Festival of Music and Dance" presented that country's foremost dances and musicians on the Eisenhower Theater stage. And under the direction of Peter Sellars, the American National Theater (ANT) began to fulfill its goal of presenting the outstanding work of leading foreign companies by importing the Suzuki Company of Toga, Japan, and its version of Euripides' *The Trojan Women*.

During its charter season, ANT also produced three original, full-scale productions in the Eisenhower Theater—Shakespeare's *Henry IV, Part I*, James O'Neill's *The Count of Monte Cristo*, and Eugene O'Neill's *The Iceman Cometh*.

Two of the nation's busiest regional theater centers were well represented at the Kennedy Center. The American National Theater, with the support of AT&T, brought two outstanding Chicago-based theater companies: the Steppenwolf Company presented Lynn Seifert's *Coyote Ugly* and gave free performances of David Rabe's *Streamers*, while the Wisdom Bridge Theater performed Shozo Sato's *Kabuki Medea* and free performances of Robert Falls' *In the Belly of the Beast*. New England's Goodspeed Opera House presented the heartwarming musical *Take Me Along* in the Eisenhower Theater.

Broadway and Off-Broadway also contributed to the Center's theatrical life with performances of the hit musical *My One and Only*, a presentation that broke box-office records for a musical at the Kennedy Center; Hal

Holbrook's enduring one-man show, *Mark Twain, Tonight!*; a revival of the classic musical, *West Side Story*; and the New York Shakespeare Festival production of Victor Rozov's contemporary Soviet comedy, *The Nest of the Wood Grouse*.

The list of outstanding performers who participated in this diverse season included Jason Robards, Barnard Hughes, Donald Moffat, Richard Thomas, Roscoe Lee Browne, Zakes Mokae, Pattie LuPone, John McMartin, Sandy Duncan, Tommy Tune, Rex Smith, Eli Wallach, and Anne Jackson.

Dance

The 1984–85 ballet season at the Kennedy Center saw several important premieres and debuts take place.

The San Francisco Ballet, the oldest professional ballet company in the United States, made its Kennedy Center debut with two repertory programs which included the East Coast premieres of the epic *A Song for Dead Warriors* and the joyous *To the Beatles*.

This season was unusually fruitful in the number of new productions of full-length ballets. Both the Joffrey Ballet and American Ballet Theatre premiered their major full-length productions of *Romeo and Juliet* during their Opera House engagements. The Dance Theatre of Harlem, sponsored by the Washington Performing Arts Society, gave the Washington premiere of its new *Giselle*, set in the Louisiana Bayou, while Ballet West performed for the first time on the East Coast its historic reconstruction of August Bournonville's exotic *Abdallah*—a work thought to be lost for more than 300 years.

Dance America, sponsored jointly by the Washington Performing Art Society and the Kennedy Center, brought back three of the nation's most important modern dance ensembles—Crowsnest, the Paul Taylor Dance Company, and Elisa Monte Dance Company. Meanwhile, the fiery Maria Benitez Dance Company and Poland's internationally acclaimed Mazowze provided extraordinary evenings of folk and ethnic dancing.

And, once again, the Opera House stage was covered in ice as the astonishing John Curry Skaters presented their unique blend of poetic ballet choreography and championship ice skating for three weeks in August.

Music

A wealth of subscription series concerts and individual

musical events filled the Kennedy Center with exemplary performances the year round.

This year marked the tricentennials of both George Fred-eric Handel and Johann Sebastian Bach, and many events celebrated these historic occasions. The ninth Kennedy Center Handel Festival, for example, opened with a gala performance of *Giulio Cesare*. Subsequent performances included the American premieres of the *Occasional Oratorio* and *Alessandro*.

The popularity of the Terrace Concerts continued to grow with several performances in the 1984–85 season breaking box-office records. Among the season's highlights were recitals and concerts by pianist Peter Serkin, the Guarneri String Quartet, violinist Uto Ughi, the Art Ensemble of Chicago, soprano Edith Mathis, and the Brandenburg Ensemble.

The annual summer visits of the Saint Paul Chamber Orchestra and Lincoln Center's Mostly Mozart Festival were made even more appealing this year with dancing and light refreshments on the River Terrace after each performance.

The Friedheim Awards, which recognize American composition in symphonic and chamber music in alternating years, awarded first prize for 1984 in the category of orchestral music to Edward Applebaum for his Symphony No. 2.

Other musical organizations returning for their annual series included the Chamber Music Society of Lincoln Center, Theater Chamber Players of Kennedy Center, and the Young Concert Artists.

The annual Holiday Festival, noted for its free events, filled the theaters and the Grand Foyer with music and dance throughout the season. "Millennium," authentic chamber music of the season played on ancient and modern instruments, and the "Singing Christmas Tree" of young people from Greenville, South Carolina, made their first appearances.

The roster of pop and country music artists presented by the Kennedy Center in the Concert Hall this season included Loretta Lynn, Tom Jones, the Pointer Sisters, Johnny Mathis, Emmylou Harris, and Victor Borge.

Finally, the Metropolitan Opera presented seven grand performances of six different operas in as many days: *Lohengrin*, *Rigoletto*, *Così fan tutte*, *Simon Boccanegra*, *La Bohème*, and *Eugene Onegin*.

Kennedy Center Affiliates

Many performances given at the Kennedy Center are pro-



duced by one of the Center's three resident affiliates: the American Film Institute (AFI), which presents classic films, independent features, foreign films, and contemporary video works in its 224-seat theater; the National Symphony Orchestra under the artistic direction of Mstislav Rostropovich; the Washington Opera, which this season presented Puccini's *La Boheme*, Lehar's *The Merry Widow*, Mozart's *Le nozze di Figaro*, Bellini's *La sonnambula*, Rossini's *L'Italiana in Algeri*, Stravinsky's *The Rake's Progress*, and Menotti's *The Medium* and *The Telephone*. In addition, the Washington Performing Arts Society presented 52 greatly varied and exceptional performances during its nine-month season.

Public Service Programming

The Kennedy Center is specifically directed by Congress to carry out a broad range of educational and public service programs. With the exception of partial U.S. Department of Education funding of three national education programs, these programs are supported by funds privately raised by the Kennedy Center from individuals, foundations, and corporations. In fiscal year 1985, \$3.37 million was allocated from the center's private contributions for the support of the national education programs, cultural diversity activities, and the privately subsidized presentation of theater, music, and dance, including many free and low-admission performances and events enjoyed by one million people in Washington, D.C., and around the country.

In addition, 16,000 people visited and used the Performing Arts Library.

Specially Priced Ticket Program

Since it opened in September 1971, the Kennedy Center has maintained a Specially Priced Ticket Program through which tickets to Center-produced and -presented attractions are made available at half price to students, handicapped persons, senior citizens age sixty-five and over, low-income groups, and military personnel in grades E-1

through E-4. The attendant costs, in terms of reduced revenue potential and administrative overhead, are borne by the Center itself and are viewed as a part of its educational and public service responsibilities.

During the twelve-month period ending September 30, 1985, 45,768 tickets for attractions produced and presented by the Center were sold at half price. The sale of these tickets at full price would have resulted in additional gross income to the Center of \$419,487. Independent producers are also requested to participate in the program by making a percentage of their tickets available for sale at half price. During the same twelve-month period, combined half-price ticket sales totalled \$66,797. The sale of these tickets at full price would have resulted in a total additional gross income of \$850,640 to the Center and the independent producers.

Education Programming

As the national cultural center, the Kennedy Center has a unique responsibility to advance all the arts in the education of the nation's youth. To meet this challenge in 1985, the Kennedy Center Education Program sponsored performances and other events that reached nearly 4 million people nationwide through three components: the Alliance for Arts Education, the American College Theatre Festival, and Programs for Children and Youth. These programs were supported in part by a generous grant from the U.S. Department of Education and major private support from the Kennedy Center Corporate Fund as well as individuals, foundations, and other corporations. Each component works closely with Very Special Arts (formerly the National Committee, Arts with the Handicapped), an educational affiliate of the Kennedy Center.

Programs for Children and Youth (PCY) is the production arm of the Education Program, providing more than 150 free performances and events to audiences of more than 60,000 at Kennedy Center in 1985. Among these were a fall performance series, a Cultural Diversity Festival, and IMAGINATION CELEBRATION, the national children's arts festival held at Kennedy Center for two weeks each spring.

Reflecting the Center's commitment to development of new works for young people, Programs for Children and Youth commissioned three new works in 1985: *The Electric Dance Transformer*, a high-tech dance piece by the Ririe/Woodbury Dance Company; *Kids Writes in the Nation's Capital*, based on the writing of some 2,000 Washington, D.C., children; and *Lady Liberty*, a musical play by Theatreworks/USA, celebrating the centennial of the

Derek Jacobi in the Royal Shakespeare Company's production of Edmond Rostand's *Cyrano de Bergerac* in the Kennedy Center Opera House.

Statue of Liberty. PCY also provided drama classes for young people and workshops in technical and musical theater.

The Alliance for Arts Education (AAE) is a national network of fifty-three committees in the states and special jurisdictions that develops and promotes the arts in the nation's educational systems. It also recognizes exemplary programs, students, and educators for their efforts in the arts and education. For instance, eight arts educators were awarded Summer Fellowships for Teachers of the Arts, which brought them to Kennedy Center for three weeks to work on an artistic project of their own design. A total of thirty-two school principals and superintendents were cited for fostering the arts in their schools and school districts. AAE also coproduced, along with the Presidential Scholars Commission and the National Foundation for Advancement in the Arts, the presentation of twenty Presidential Scholars in the Arts in a performance in the Concert Hall. The Kennedy Center Award for Excellence, which recognizes an acclaimed artist for contributions to the arts and to young people, was given by AAE in 1985 to Burl Ives, who now serves as its National Spokesperson for the Arts in Education. The award has been renamed the Frances Holleman Breathitt Award for Excellence in recognition of the many contributions to arts education of the late Kennedy Center trustee and Education Committee chairperson. AAE also sponsored national Town Meetings, regional and state conferences, and published *Interchange*, a newsletter that reaches nearly 6,000 people across the nation.

Outreach IMAGINATION CELEBRATION festivals, now presented through AAE, in 1985 welcomed the participation of nearly 320,000 young people, families, and teachers in festivals at twenty-one sites in eleven states and the District of Columbia. Festivals were held for the first time in Kansas City, Missouri, in Winston-Salem, North Carolina, and in Louisville, Kentucky.

For the seventeenth year, the American College Theatre Festival (ACTF) combined the efforts of theater educators and theater professionals to provide a national showcase for college theater. More than 12,000 students and 2,000 faculty members from nearly 400 schools participated in 1985. A record 572 college theater productions were entered and evaluated at local levels; nearly sixty were selected for twelve regional festivals. Six finalists were brought to Washington for the national festival at Kennedy Center. They were *Sweeney Todd*, California State University, Los Angeles; *Bruinhaha*, University of California, Los Angeles; *Excursion Fare*, University of Oregon, Eugene; *How I Got That Story*, Virginia Tech, Blacksburg; *What I*

Did Last Summer, University of Tulsa; and *Hiawatha*, University of Richmond. Audiences for all productions entered in ACTF XVII totaled more than 1 million.

ACTF also cosponsored numerous awards programs in playwriting, design, criticism, acting, and theater administration. It cosponsored for the eighth year the Shenandoah Valley Playwrights Retreat in Verona, Virginia, and selected nine college seniors for a career development symposium that culminated in showcases for producers and casting agents in Washington and New York.

ACTF is produced by the Kennedy Center in cooperation with the University and College Theatre Association, a division of the American Theatre Association.

All components of the Kennedy Center Education Program are supported individually by an Educational Services division, which uses the performing arts resources at Kennedy Center as the basis for workshops and other educational formats and events for teachers, parents, and the general public. In 1985 approximately 2,000 teachers and more than 4,000 high school students were direct participants in these programs.

Funding

Completed in 1971 at a cost of \$85 million, approximately half of which was contributed by the government and the rest by the private sector, the Kennedy Center is unique in its operation as both a performing arts center and a presidential memorial. The National Park Service provides for the operating costs of the presidential memorial aspects of the building; the performing arts center is charged a pro-rata share totaling more than \$1 million annually. Meanwhile, the Kennedy Center is wholly responsible for the cost of maintaining and improving its theater, backstage, and office facilities.

Artistic programming at the Kennedy Center and its day-to-day performing arts operations have been almost entirely privately supported. In addition to supporting the performing arts which fill its five houses, the Center also makes possible a wide range of education and public service activities for which it raises private funds. Since the Center's opening in 1971, foundations, corporations, and individuals have contributed more than \$38 million for these purposes. The nation's business community has played an important part in this effort through the Corporate Fund established in 1977 by a group of dedicated business leaders. Under the leadership of Corporate Fund Chairman John F. Welch, Jr., chairman of the General Electric Company, the 1985 Corporate Fund contributed

more than \$2.24 million from nearly 300 corporations.

In recent years, less than 3 percent of the annual operating budget of the Kennedy Center has been from federal sources and most of these funds have been received from the U.S. Department of Education for the Center's education programs.

In 1985 the Kennedy Center received a \$1 million challenge grant from the National Endowment for the Arts (NEA) to help establish an endowment for the Kennedy Center. This is the first major grant the Center has received from the NEA, and it must be matched three to one with private funds. This grant will be used for an endowment to help support the Center's programs.

Kennedy Center Honors

The Kennedy Center Honors were first awarded by the board of trustees in 1978 to recognize the contributions to the cultural life of our nation by its finest performing artists. An annual event, the Honors Gala is the center's most important fundraising benefit; the 1984 gala raised just under \$1 million in net proceeds to support Kennedy Center programming. The 1984 honorees were Lena Horne, Danny Kaye, Gian Carlo Menotti, Arthur Miller, and Isaac Stern. Preceding the 1984 Honors Gala in the Opera House was a reception at the White House, hosted by President and Mrs. Ronald Reagan. Among the performers who participated in the evening's tributes, later broadcast to more than 25 million viewers by CBS as a holiday season special sponsored solely by General Motors, were Debbie Allen, Lillian Gish, Karl Malden, Itzhak Perlman, Roberta Peters, Carl Reiner, Julius Rudel, George Segal, Eli Wallach, and Dionne Warwick.

Friends of the Kennedy Center

The Friends of the Kennedy Center is a nationwide organization of volunteers and donor members founded in 1966 to raise grassroots support for the building of a national cultural center. Today, the organization consists of 27,000 donor members and 450 volunteers.

Revenues from the Friends membership program, gift shops, and fundraising events help to support a number of national and community outreach projects. In June 1985, for instance, the Friends organization sponsored the first Kennedy Center open house, a day-long festival of free performances and activities that drew crowds of more than 50,000. Other public service programs supported in part

by Friends revenues included the Specially Priced Ticket Program, the American College Theatre Festival, the IMAGINATION CELEBRATION festivals for children, and free organ concerts for the public. The volunteer force staffed the Friends' gift shops, provided special assistance to handicapped visitors, administered the Specially Priced Ticket Program, and conducted free tours of the Center.

In May 1985, the first official Friends chapter outside Washington, D.C., was established in Dallas, Texas.

Board of Trustees

The Kennedy Center is independently administered as a bureau of the Smithsonian Institution by a board of trustees, thirty of whose members are citizens appointed by the President of the United States for ten-year overlapping terms. The remaining fifteen members are legislatively designated ex officio representatives of the legislative and executive branches of the federal government.

The President's Advisory Committee on the Arts

Established by the 1958 Act of Congress that created the National Cultural Center, the fifty-one-member President's Advisory Committee on the Arts is appointed by the President of the United States to serve during his term of office. Its objectives are to support and promote the Kennedy Center. Representing membership from forty-nine states, the committee during the past year attended four meetings at the Center; its members concentrated their efforts on private fundraising and national outreach programs.

National Gallery of Art

J. Carter Brown, Director

The National Gallery of Art, although formally established as a bureau of the Smithsonian Institution, is an autonomous and separately administered organization. It is governed by its own board of trustees, the ex officio members of which are the Chief Justice of the United States, the Secretary of State, the Secretary of the Treasury, and the Secretary of the Smithsonian Institution. In May, the general trustees accepted with regret Paul Mellon's decision to retire from the board. Franklin D. Murphy was elected chairman of the board, with John R. Stevenson and Carlisle H. Humelsine continuing to serve as president and vice-president, respectively. Ruth Carter Stevenson continues to serve as a general trustee. Robert H. Smith, president of the Charles E. Smith Construction Company, was elected to fill the vacancy caused by Mr. Mellon's retirement.

During the year, visitors entering both of the National Gallery's buildings numbered 5,079,858. Distinguished visitors included the Vice President and Mrs. Bush, India's Prime Minister and Mrs. Rajiv Gandhi, Queen Noor of Jordan, and the Prime Minister of Turkey.

Eight new galleries were opened on the main floor of the Gallery to display seventy-five large fourteenth-seventeenth-century Italian sculptures, some of which have been off exhibition for several years. For the first time since 1971, the finest and richest collection of Italian Renaissance sculpture in the Western Hemisphere is now fully on display, with almost a thousand objects on permanent exhibition.

A number of changes in the programs offered by the education division underlined the Gallery's policy of offering quality service to the largest audience possible. The information unit of the new department of public programs has increased its staff many times by the recruitment of approximately eighty volunteers from the metropolitan area to staff the three information desks. The interpretation unit, consisting of fifteen staff lecturers, has revised and augmented the range of programs available to the visitor. In addition to the traditional general tours and special subject tours and talks, the department now offers lecture courses which are given over several weeks on particular subjects covered by the Gallery collections and by the temporary exhibitions.

Two guides to temporary exhibitions were written for children and a new program was developed for parents and their children on Saturday mornings.

A week-long experimental summer program for area children ages eleven to thirteen was developed in cooperation with the District of Columbia recreation department. Three groups of fifteen young people met for one hour

every morning with Gallery staff at their recreation centers, then came to the Gallery for two hours of various activities.

In connection with the exhibition of contemporary printmakers, *Gemini G.E.L.: Art and Collaboration*, three artists, Robert Rauschenberg, Roy Lichtenstein, and David Hockney, were interviewed by prominent critics or curators before standing-room-only audiences.

Among the thirty-two guest speakers who gave lectures on Sunday afternoons were Richard A. Wollheim, 1984 A.W. Mellon Lecturer in the Fine Arts, who gave six talks on *Painting as an Art*, and James S. Ackerman, 1985 A.W. Mellon Lecturer in the Fine Arts, who gave six talks on *The Villa in History*. Other speakers included Pramod Chandra, Bickford Professor of Indian and South Asian Art at the Fogg Museum at Harvard University; Wolf-Dieter Dube, director of the Staatliche Museen, Preussischer Kulturbesitz, Berlin; Agnes Mongan, former director of the Fogg Museum; Konrad Oberhuber of the Fogg Museum; the Honorable Mrs. Roberts, curator of the print room, Royal Library, Windsor Castle; Duncan Robinson, director of the Yale Center for British Art; and Giles A. Waterfield, director of the Dulwich Picture Gallery in London.

The Gallery's well-attended film program continued to highlight not only the temporary exhibitions, but also, for the fourth consecutive year, the works of a noted contemporary filmmaker. An eight-part retrospective of the films of Kenji Mizoguchi was selected and introduced by Peter Brunette, professor of English and cinema at George Mason University.

The availability of fifteen extension program films on VHS and Beta format videocassettes as well as the 3/4" U-Matic format, has contributed to a 45 percent rise in the use of those programs. A further reason for a 35 percent increase over 1984 in the total number of extension program presentations, to a total of 66,500, is a rise to over three hundred participating agencies serving as satellite distributors of the programs via the Affiliate Loan System. Reports from these agencies show levels of program use that are almost double those of fiscal year 1984.

Four outstanding groups of drawings were received as gifts—Professor Julius Held added sixty-nine old master and modern drawings to the fine collection he donated last year; a collection of five Winslow Homer watercolors and four major pastels and gouaches by Everett Shinn was bequeathed; an extraordinary selection of works by Max Beckmann, including forty-four sketchbooks spanning the artist's entire working life, was donated by his widow; and a further group of forty-nine Beckmann drawings from the

1920s through the 1940s was given. A generous gift of funds made possible the purchase of a large Constable drawing of an elm tree. Other important purchases of drawings included a number of fine Netherlandish works among which are two chalk drawings by Henrik Goltzius and a landscape by Bartholomeus Breenbergh.

Print acquisitions included a fine impression of Jacopo de Barbari's *Mars and Venus*, a rare artist's proof of a Gainsborough landscape, and several nineteenth-century French prints by Corot, Daubigny, and Gauguin.

Three major old master paintings were acquired, as well as two works by major twentieth-century artists: the *Madonna and Child with Saint Elizabeth and Saint John the Baptist*, a Mannerist altarpiece by sixteenth-century Florentine artist, Jacopino del Conte; a major seventeenth-century Dutch painting, *Dutch Ships in a Stormy Sea* by Ludolf Bakhuysen, the first Dutch marine in the collections; a sixteenth-century German portrait by Bavarian court painter Hans Muelich; a surreal landscape by French artist, Yves Tanguy; and *Doric Circus* by Robert Rauschenberg. Other twentieth-century artists whose works were acquired were painters Ellsworth Kelly and Jack Beal and sculptors Harry Bertoia and Robert Graham. A gift of a rare small plaster maquette by Henry Moore, in superb condition and one of only two such works by Moore known to be in American collections, was also received.

Of the sixteen temporary exhibitions of works borrowed from outside lenders, several drew from outstanding collections in the United States and abroad. The Albertina in Vienna lent seventy-five old master drawings among which were ten by Durer, including his *Praying Hands*. The exhibition was scheduled to coincide with the bicentennial of economic and political relations between Austria and the United States.

The Terra Museum of American Art lent an exhibition of fifty-three monotypes by Maurice Prendergast; fifty studies of horses and other animals by Leonardo da Vinci were borrowed from the Royal Library at Windsor Castle; the Dulwich Picture Gallery in London sent thirty-six old master paintings to be seen in the United States for the first time; one hundred of the finest European drawings, from Leonardo to van Gogh, were lent by the Budapest Museum of Fine Arts; fifteen American paintings were borrowed from Dr. Armand Hammer to honor the presidential inauguration; one hundred drawings from the fifteenth to the twentieth centuries were lent from one of the most exceptional private drawing collections in America, the Curtis O. Baer Family Collection; and Ruth and Jacob Kainen lent approximately one hundred German Expressionist prints from their collection.



Mrs. George Bush, Paul Mellon, Mrs. Mellon, and Vice President Bush (left to right) arrive for a dinner at the National Gallery of Art in honor of Mr. Mellon on the occasion of his retirement from the Gallery's board of trustees.

An exhibition of the sculpture of India from 3000 B.C. to A.D. 1300 opened the nationwide Festival of India, a series of artistic events in 1985-86 illuminating the history and culture of India. Included were more than 100 pieces in stone, ivory, and bronze, many of them never before seen outside India. From approximately the same period of time in the woodland areas of southeast and midwest North America, one hundred fifty masterworks of prehistoric native American art were shown for their artistic merit as well as their cultural and archaeological significance.

An exhibition of Edgar Degas' most important paintings and sculpture of ballet subjects, with the pastels and drawings related to them, celebrated the 150th anniversary of the artist's birth.

A symposium on Renaissance plaquettes, sponsored by the Center for Advanced Study in the Visual Arts, brought together experts from the United States and Europe to discuss various problems concerning the art form. This was the third gathering in a series that began in 1983 with lectures on Renaissance bronzes and continued in 1984 with a symposium on Renaissance medals.

Temporary Exhibitions

Renaissance Drawings from The Ambrosiana, 1370-1600
continued from the previous fiscal year to 7 October 1984
coordinated by The Medieval Institute, University of
Notre Dame, and Diane de Grazia and supported by The
Samuel H. Kress Foundation and the Federal Council on
the Arts and Humanities

*The Orientalists: Delacroix to Matisse, The Allure of
North Africa and the Near East*
continued from the previous fiscal year to 28 October 1984
coordinated by MaryAnne Stevens, Royal Academy of
Arts, D. Dodge Thompson, and Florence E. Coman

John James Audubon: Birds of America
14 October 1984 to 10 March 1985 coordinated by Carlotta
J. Owens

American Naive Watercolors and Drawings
14 October 1984 to 13 January 1985 coordinated by
Deborah Chotner

Index of American Design
14 October 1984 to 27 January 1985 coordinated by Laurie
Weitzenkorn

Thomas Moran's Watercolors of Yellowstone
14 October 1984 to 27 January 1985 coordinated by the
Thomas Gilcrease Institute, Nicolai Cikovsky, Jr., and
Linda Ayres

Old Master Drawings from the Albertina
25 October 1984 to 13 January 1985 coordinated by the
International Exhibitions Foundation and Andrew Robi-
son and supported by the Federal Council on the Arts and
the Humanities and United Technologies Corporation.

Gemini G.E.L.: Art and Collaboration
18 November 1984 to 24 February 1985 coordinated by
Ruth Fine

Degas: The Dancers
22 November 1984 to 10 March 1985 coordinated by
George T.M. Shackelford and supported by the Federal
Council on the Arts and Humanities

Master Prints from Washington Collections
24 November 1984 to 10 March 1985 coordinated by
Andrew Robison

*The Washington Family by Edward Savage: An Inaugural
Celebration*
13 January to 18 February 1985

*American Paintings from the Armand Hammer Collection:
An Inaugural Celebration*

13 January to 18 February 1985 coordinated by Nicolai
Cikovsky, Jr., and supported by The Armand Hammer
Foundation and the Occidental Petroleum Corporation

*Monotypes by Maurice Prendergast from the Terra
Museum of American Art*

27 January to 14 April 1985 coordinated by Cecily
Langdale, Terra Museum of American Art, Evanston, and
Nicolai Cikovsky, Jr.

Landscape Drawings from the Collection
3 February to 2 June 1985

Landscape Prints from the Collection
3 February to 4 August 1985

*Leonardo da Vinci Drawings of Horses from the Royal
Library at Windsor Castle*

24 February to 9 June 1985 coordinated by The Royal
Library, Windsor Castle, by the Honorable Jane Roberts,
Curator, Prints and Drawings, Windsor Castle, and H.
Diane Russell and supported by the Federal Council on the
Arts and the Humanities

Robert Nanteuil: Portrait Engraver to the Sun King
10 March to 28 April 1985 coordinated by H. Diane
Russell

Ancient Art of the American Woodland Indians
17 March to 4 August 1985 coordinated by David W. Pen-
ney, Detroit Institute of Arts and supported by The
National Endowment for the Arts, The Stroh Foundation,
and the Founders Society Detroit Institute of Arts

*Collection for a King: Old Master Paintings from the
Dulwich Picture Gallery*

14 April to 2 September 1985 coordinated by Giles Water-
field, Director, Dulwich Picture Gallery, and Arthur
Wheelock and supported by the Federal Council on the
Arts and the Humanities and Gerald D. Hines Interests

The Sculpture of India: 3000 B.C.-1300 A.D.

3 May to 2 September 1985 coordinated by Pramod Chan-
dra, The George P. Bickford Professor of Indian Art, Har-
vard University, and D. Dodge Thompson and supported
by the Hinduja Foundation (S.P. and E.P.), Boeing Com-
pany, The Coca-Cola Foundation, The General Foods
Fund, ITT Corporation, Lockheed Corporation, Roland
International Corporation, Varian Associates, and Wyeth
Laboratories

Stubbs: An Exhibition in Honor of Paul Mellon
4 May to 2 June 1985 coordinated by D. Dodge Thompson
supported by the Federal Council on the Arts and the
Humanities and United Technologies Corporation

Leonardo to Van Gogh: Master Drawings from Budapest
12 May to 14 July 1985 coordinated by Klara Garas,
Museum Fine Arts, Budapest, and Diane DeGrazia and
supported by Occidental Petroleum Corporation, National
Endowment for the Arts, and the Federal Council on the
Arts and the Humanities

NGA Twentieth Century Collection
May 1985 to April 1986

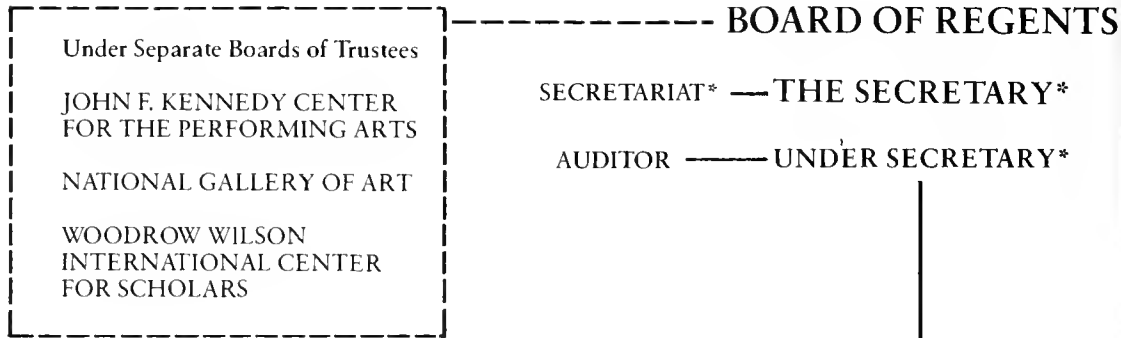
Figure Drawings from the Collection
9 June to 19 October 1985

Selections from the Index of American Design
25 June to 29 September 1985

*Master Drawings from Titian to Picasso: The Curtis O.
Baer Collection*
28 July to 6 October 1985 coordinated by The High
Museum, Atlanta, and Andrew Robison

Figure Prints from the Collection
18 August 1985 to 16 February 1986

*German Expressionist Prints from the Collection of Ruth
and Jacob Kainen*
22 September 1985 to 9 February 1986 coordinated by
Andrew Robison



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 National Museum of Man
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 Smithsonian Tropical Research Institute

**Assistant Secretary for
 HISTORY AND ART***

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 Center for Asian Art
 Freer Gallery of Art
 Sackler Gallery of Art
 Cooper-Hewitt Museum
 Hirshhorn Museum and Sculpture
 Garden
 Joseph Henry Papers
 National Museum of African Art
 National Museum of American Art
 Renwick Gallery
 National Museum of American History
 National Portrait Gallery
 Office of American Studies

*Secretary's Management Committee

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Cover: Facing the Mall in front of the Smithsonian "Castle" is a statue of Joseph Henry, the first Secretary of the Institution.
(Photograph by Chip Clark)

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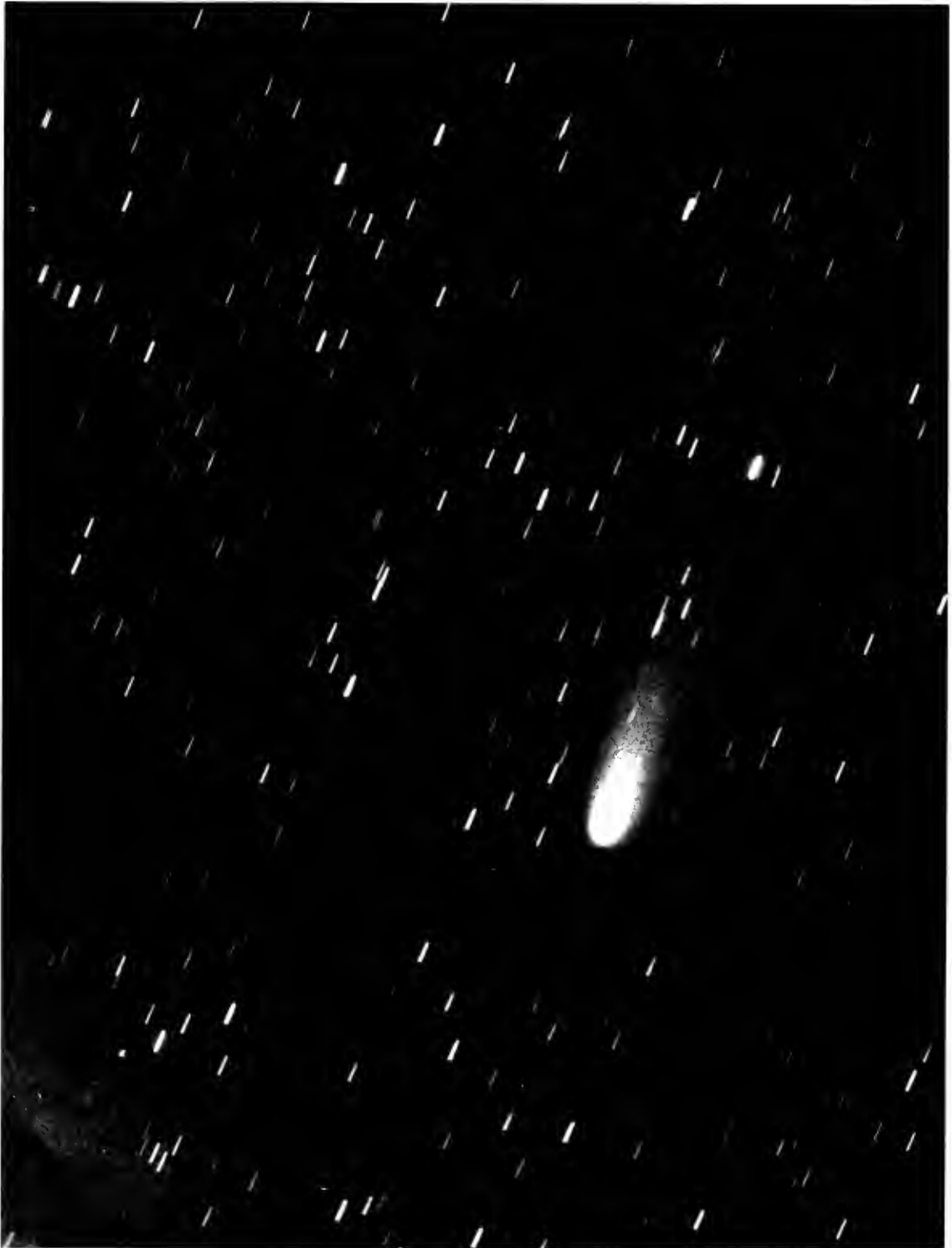
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Smithsonian Year 1986

Annual Report of the Smithsonian Institution for the Year Ended September 30, 1986



Comet Halley was photographed in mid-March 1986 by a Baker- Nunn camera at the Fred L. Whipple Observatory in southern Arizona. The camera, twenty-five years ago the bulwark of the Smithsonian's satellite-tracking program, was reactivated especially to record the historic return of the comet. (Photograph by Don Hogan, Ed Horine, and Daniel Brocius)

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SMITHSONIAN INSTITUTION

The Smithsonian Institution was created by act of Congress in 1846 in accordance with the terms of the will of James Smithson of England, who in 1826 bequeathed his property to the United States of America "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." After receiving the property and accepting the trust, Congress incorporated the Institution in an "establishment," whose statutory members are the President, the Vice President, the Chief Justice, and the heads of the executive departments, and vested responsibility for administering the trust in the Smithsonian Board of Regents.

The Establishment

Ronald W. Reagan, President of the United States
George H. W. Bush, Vice President of the United States
Warren E. Burger, Chief Justice of the United States
(until September 26, 1986)
William H. Rehnquist, Chief Justice of the United States
(from September 26, 1986)
George P. Shultz, Secretary of State
James A. Baker III, Secretary of the Treasury
Caspar W. Weinberger, Secretary of Defense
Edwin Meese III, Attorney General
Donald P. Hodel, Secretary of the Interior
Richard E. Lyng, Secretary of Agriculture
Malcolm Baldrige, Secretary of Commerce
William E. Brock, Secretary of Labor
Otis R. Bowen, Secretary of Health and Human Services
Samuel R. Pierce, Jr., Secretary of Housing and Urban
Development
Elizabeth H. Dole, Secretary of Transportation
William J. Bennett, Secretary of Education
John S. Herrington, Secretary of Energy

Board of Regents

Warren E. Burger, Chief Justice of the United States,
ex officio (until September 26, 1986)
William H. Rehnquist, Chief Justice of the United States,
ex officio (from September 26, 1986)
George H. W. Bush, Vice President of the United States,
ex officio
Edwin J. (Jake) Garn, Senator from Utah
Barry Goldwater, Senator from Arizona
James R. Sasser, Senator from Tennessee
Edward P. Boland, Representative from Massachusetts
Silvio O. Conte, Representative from Massachusetts
Norman Y. Mineta, Representative from California
David C. Acheson, citizen of the District of Columbia
Anne L. Armstrong, citizen of Texas
William G. Bowen, citizen of New Jersey
Jeannine Smith Clark, citizen of the District of Columbia
Murray Gell-Mann, citizen of California
A. Leon Higginbotham, Jr., citizen of Pennsylvania
Carlisle H. Humelsine, citizen of Virginia
Samuel C. Johnson, citizen of Wisconsin
Barnabas McHenry, citizen of New York

The Secretary

Robert McCormick Adams

Dean W. Anderson, Under Secretary and
Acting Assistant Secretary for History and Art
David Challinor, Assistant Secretary for Research
Joseph Coudon, Special Assistant to the Secretary
Tom L. Freudenheim, Assistant Secretary for Museums
(from February 3, 1986)
Margaret C. Gaynor, Congressional Liaison
James M. Hobbins, Executive Assistant to the Secretary
John F. Jameson, Assistant Secretary for Administration
Ann R. Leven, Treasurer
Peter G. Powers, General Counsel
John E. Reinhardt, Director, Directorate of International
Activities
William N. Richards, Acting Assistant Secretary for
Museum Programs (until February 3, 1986)
Ralph C. Rinzler, Assistant Secretary for Public Service
James McK. Symington, Director, Office of Membership
and Development

Statement by the Secretary

Robert McC. Adams

For the Smithsonian, as for many institutions dependent on public funding, 1986 was a year of increasing uncertainty. Budgetary constraints have begun to bite deeply into our capacity to make and execute any new, ambitious, long-range plans. Federal funding for new starts involving construction is more and more problematic. Facilities actually under way and nearing completion fortunately have been spared sweeping reductions. Yet we face difficulties in meeting minimal staff and equipment requirements to open these facilities without seriously eroding programmatic strength in other parts of the Institution.

At the same time, unrelieved pessimism about the possibilities for further strengthening and even growth of the Institution in the years immediately ahead is unjustified. Uniquely embodied in our program is the provision for private as well as federal support. Our own experience reinforces the general impression that private funding is inherently a more likely source of support for new beginnings of all kinds.

While federal and private funding complement one another, they are not freely interchangeable. Requirements of accountability to the Smithsonian's Board of Regents and to the Congress mean that, for the most part, federal and private funding must be devoted to different functions or objectives. It would obviously discourage private donors if we were merely to substitute nonappropriated funds for obligations abandoned by the federal government. And the net contribution of all our nonfederal sources of income, in any case, is only about one-fifth of our total operating budget. Even under optimistic projections of further growth, private funds could not offset any major loss of federal support.

To cite an important current example of private support, we have turned to the computer and communications industry for the underwriting of a major, multiyear effort to portray the extraordinary impacts that the information revolution is having on our lives. In *The Information Revolution* exhibition being developed at the National Museum of American History, our intent is to focus not on a particular set of technical achievements and possibilities, but rather on the effects these have had and will have on careers, hopes, the quality of lives, and horizons of understanding. Thus the familiar kind of exhibition narrative, largely dependent as it would be in this case on communications or information hardware, falls far short of our objective. Finding a fundamentally different, truly superior alternative then takes us on a long journey into uncharted waters.

What is information and how do we manipulate it—

not merely with machines but *in our minds*? When do quantitative changes in the rates of movement, or memory storage, or processing of information become qualitative changes in our capacities for management and understanding? Is there really such a thing as artificial intelligence? Do computers introduce new ambiguities into the boundaries we draw around consciousness and motivation? How will computers affect not only our health, our schooling, and our workplaces, but our modes and frames of thought? Broad and challenging questions like these do not surface ordinarily in specialized discussions among museum curators. In this exhibition such questions are suddenly central. Probably they will remain so even after the exhibition opens, for we expect to supplement the usual, static labels with interactive displays. These displays should not only inform a diverse stream of visitors on issues of their own choice, but should also record a dialogue from which we too can learn. All this is precisely the type of call upon our vision and imagination that usually requires support from private sources before it can win public acceptance.

I do not want to give the impression that the most important or even the most pleasurable task at the Smithsonian is setting new directions. Perhaps an even deeper or more consistent purpose is to advance knowledge cumulatively by building on the huge resource of our collections. With these collections, it is a long-held objective to draw the public's interests and critical sensibilities into new and unfamiliar realms. We stake much on our ability to choose research objectives that can justify and sustain unremitting, long-term efforts.

In short, the dual goals of assuring continuity and identifying new challenges or opportunities are at the heart of the enterprise. Rather than being separate undertakings, these goals involve many of the same individuals and flow into and out of one another. This could be illustrated in virtually any part of the wide spectrum of the Smithsonian's research, exhibition, or educational activities, from the arts to the sciences. Lacking space to illustrate exhaustively, I confine myself in this year's report to the life sciences. Even here, for reasons of space, I cannot refer to the scores of projects in which individuals or small groups of curators are engaged, but must limit myself to a few larger-scale, organized activities. Yet in each case the restricted example vigorously demonstrates the convergence of new and highly differentiated interest with other concerns that have long been addressed in the Smithsonian's programs.

The presence here of deeply rooted biological concerns is surely no surprise. There is an enduring national

need—prominently recognized during the early era of exploration but no less urgent today—for great, systematically studied collections of biological resources drawn from all over the world. The task of assembling, analyzing, and publishing these collections is enormous, and open-ended in the sense that it will demand continuing reinterpretation and refinement. It cannot easily be dispersed among many institutions or privatized. Moreover, much of the direct use of the collections is of a federalized character. Many scientists from such federal agencies as the Department of Agriculture and the National Institutes of Health regularly work side by side with our own curators, investigating questions of practical importance for which the collections are an indispensable tool. Hence the primacy of biological research at the Smithsonian is understandable. It is only appropriate that there has long been a major commitment of funds from our federal budget to the development and care of our collections.

The traditional concern for improving these collections is concentrated in the National Museum of Natural History, where the number of registered objects and specimens exceeds eighty million. In support of the same concern, we direct a major portion of our research efforts toward natural field settings worldwide. Given the concentration of most university-based scientific research in laboratories, it is in the combination of collections-based research and fieldwork that the Smithsonian's opportunities to make a unique contribution are the greatest.

Exemplifying the multifaceted importance of our natural history collections is the Smithsonian's grass herbarium; its more than 250,000 specimens constitute the largest and most significant collection in existence. Plant communities dominated by grasses account for almost a fourth of the earth's land surface, and a mere twenty species of grasses supply some 90 percent of the world's food. Apart from providing food, grasses like bamboo supply vital construction timber in Southeast Asia, for example, as well as fiber for paper, mats, and utensils of many kinds. Other grasses feed livestock, control erosion, make turf, and provide a sugar source for alcohol. In recognition of these critical and diverse contributions, the first International Symposium on Grass Systematics and Evolution was held at the Smithsonian in July 1986. The proceedings, jointly sponsored with the National Science Foundation and the American Institute of Biological Sciences, are being published by the Smithsonian Institution Press.

Having emphasized the importance of our systematic collections, I also note with great pleasure the appoint-

ment in October 1985 of Dr. Robert S. Hoffmann to the directorship of the National Museum of Natural History. Dr. Hoffmann, a leading United States expert on mammalian systematics and ecology and formerly Summerfield Distinguished Professor at the University of Kansas, took up his new duties in May 1986. The Soviet Union is among the world regions in which he has conducted extensive field research, and he has served on the U.S.-U.S.S.R. Joint Commission on Science Policy of the National Academy of Sciences. He succeeds Dr. Richard S. Fiske, who has returned to the Department of Mineral Sciences to resume his research on volcanoes.

Providing a kind of capstone for all our recent biological efforts was a National Forum on BioDiversity. Held in September 1986, it was jointly undertaken by the Smithsonian and the National Academy of Sciences. This newest reflection of an old and continuing partnership involved an outstanding group of active participants, whose interests ranged from agricultural development to conservation, ecosystem management, and systematic biology. Besides drawing more than a thousand formal registrants, the proceedings attracted exceptionally wide interest from the media. A national teleconference at the conclusion of the forum was broadcast by satellite to 102 downlink sites in universities and laboratories around the country, and other sessions were carried by Voice of America broadcasts in Spanish and Portuguese to much of Latin America.

The forum dealt with tropical forests and coral reefs, grasslands and islands, current problems and the geological record, zoos and botanical gardens, and new technologies such as *in vitro* fertilization. But the core issues concerned the huge, still largely unmeasured proliferation of natural life that is now in jeopardy in many parts of the world. Estimates of current and projected rates of species extinction vary widely, but even the lowest estimate put forward at the forum—9 percent over the next few decades—would be a matter of great concern. And in any case, the current rate of destruction is greatest where the dangers of possible extinction of truly catastrophic numbers of species also are greatest: in tropical forests.

Timber harvesting, land clearance for commercial cattle grazing, and encroachments for subsistence farming on thin, easily depleted tropical soils by burgeoning rural populations in many underdeveloped countries all play a part in the destructive processes that are widely at work in the tropics. These processes go forward not only in many small encroachments on forest margins, but sometimes in massive clearings in the very heart of the largest,



Secretary Robert McC. Adams greets Vice President George Bush in front of the restored Grumman F6F-3 at the National Air and Space Museum. Also pictured are (left to right): Secretary of Defense Caspar W. Weinberger; Frank A. Bennack, Jr., president of the Hearst Corporation; Secretary of the Navy John Lehman; Vice Admiral Edward H. Martin; and Daniel J. Coleman, publisher of *Popular Mechanics*.

still mainly undisturbed areas like the Amazon basin. Accounting for only some 7 percent of the earth's land surface, these immense reservoirs of differentiated life almost certainly harbor well over half of all living species. By one estimate, as many as thirty million insect species alone—the overwhelming proportion of them never studied or represented in collections—are mostly confined to rain forest canopies.

There are cogent, practical arguments for taking urgent steps to preserve tropical ecosystems where we can and for getting on much more rapidly with the daunting task of inventorying the resources that could be irretrievably lost before their existence has even been recognized.

The presence among them of potentially important food plants and pharmaceuticals can be predicted with near certainty. Included in the gene pools that will otherwise vanish are vital future contributions to the over-all range of genetic variability. But no less important is the potential loss to science of a substantial part of its data base in fundamental biology.

Biodiversity, thus, is a shorthand symbol for deep and growing concerns; it may even have become a rallying cry. But this is not to say that the forum offered prescriptions for assured success in treatment of a highly complex series of problems, or even offered certainties of measurement of precisely how serious those problems

are. The scientific needs alone dwarf the numbers of trained, available personnel. Questions in almost all tropical areas vastly outnumber answers. To what extent will it be possible, for example, for genetic engineering and other modern technologies to provide us with replacements for species losses that may occur? How can we constructively modulate concerns for conservation that now tend to be voiced most strongly in the developed countries of temperate latitudes, with the natural and overwhelming desire of less developed countries in more tropical latitudes to close the development gap and also meet the needs of their still rapidly growing populations? What is the role of so-called "market forces"—not as they may be conceived in theory but as they actually exist in a world of growing deficit constraints and world trade barriers and imbalances—in either exacerbating or ameliorating the problems of ecosystem deterioration and species extinction?

If I have any sense of personal dissatisfaction with the very full agenda that was laid out for the National Forum on BioDiversity, it arises from the domain touched upon by these particular questions. The challenges we face are largely a product of organized human actions. Similarly the only measures by which these challenges can be met need to be designed and implemented by human societies and organizations. Harmonizing the preservation of biodiversity with the almost crushing economic forces and social problems that threaten it is a responsibility that needs to be more widely shared, with social scientists, in particular, coming forward to bear a greater part of the burden.

Not surprisingly, the primary impetus for organizing the forum came from those in the scientific community most familiar with and most immediately affected by the ongoing destruction around them. Also involved were economic and other specialists concerned with international finance and development. Most heartening was the widespread public interest, which, while recent, is evidently now awakened and growing rapidly.

One long-established and substantial biological research activity of the Smithsonian, the Rockville, Maryland, headquarters of the Smithsonian Environmental Research Center (SERC), was gradually dismantled during the latter part of fiscal year 1986, finally to be closed in November. Research at this leased facility had focused on mechanisms regulating the growth and development of plants down to their cellular and subcellular levels. The decision to terminate the Rockville facility activities—transferring some of its ongoing experiments, monitoring activities, personnel, and equipment to other

parts of the Institution—followed a series of external and internal reviews.

While generally upholding the quality of much of the work being done, these reviews noted that the laboratory's work was relatively narrow in focus and somewhat isolated from the broader context of the Institution's over-all biological programs. Lacking the additional resources that would have been necessary to rehouse and revitalize the laboratory's experimental work upon termination of its lease, the difficult decision was made to concentrate available funds on the pursuit of more central themes of systematics and evolutionary biology elsewhere in the Smithsonian. Some of the laboratory's research, including solar, carbon dioxide, and other environmental monitoring, has been transferred to the other SERC facility at Edgewater on the Chesapeake Bay. The bulk of the funding allotted for the Rockville facility will, it is hoped, be made available for intensified research programs at the Smithsonian Tropical Research Institute, the National Museum of Natural History, and the National Zoological Park.

Tropical forests exemplify resources that need to be viewed as world responsibilities and concerns. Their potential for meeting human needs as well as for advancing scientific understanding can be achieved only in a genuinely international spirit and setting. That is precisely in accordance with the tradition of Smithsonian programs, for here international activities have always played an important, perhaps even preponderant, part. Our relations with well over a hundred countries have been briefly summarized in a recent directory. Evident as a two-part underlying principle is the special emphasis on long-term contributions for which the Institution is especially well fitted and the maintenance of a corresponding degree of independence from current and thus transitory policy objectives.

The Smithsonian Tropical Research Institute (STRI) is an outstanding example of this principle of operation. Devoted to tropical rain forest and marine biology, STRI studies in Panama have continued for over sixty years and today provide the most advanced and diversified body of information on tropical ecosystems in the world. Hundreds of Latin American scientists and their students collaborate annually in this work. STRI constitutes a standard of what international cooperation in science should be: low-key but highly productive and broadly interdisciplinary collaboration based on an unconstrained two-way flow of information, carried on in an atmosphere thoroughly insulated from national rivalries.

The prevailing state of affairs in international schol-



Orchids bloom at the Office of Horticulture greenhouses, located at the U.S. Soldiers' and Airmen's Home, Washington, D.C.

arly and scientific research falls regrettably short of this standard. In November 1985, the Smithsonian and the Social Science Research Council jointly sponsored a conference to survey what are widely perceived to be the growing problems of international research access, especially in Third World countries. This is a somewhat ironic development in view of the vast increase in the quality and size of the international research community since World War II, the greatest part of it as a result of Western training. Participants at the conference from a fairly wide range of institutions and disciplines found themselves in general agreement on the seriousness of the problem as well as its disturbingly increasing frequency.

There is little doubt that obstacles to U.S.-initiated field research programs in the Third World have become irregularly but cumulatively more common. Any general tendency is qualified by occasional partial reversals and numerous individual exceptions. The net effect, however, is a spreading imposition of a great variety of restrictions on access. Yet I should stress the judgment of knowledgeable observers that strongly nationalistic, anti-Western officials or ideologies are not the principal forces responsible for these difficulties. Such individuals and views

obviously are present and have some influence, but in most countries there is little to suggest that they have become significantly more influential in the last generation or so. Not overt acts but inaction and delay are the most usual barriers to access, and they may often be consequences of the unchecked bureaucratic growth that has accompanied heartening developments like widened literacy and political participation. If this is so, we cannot expect difficulties to disappear with increasing levels of development. Indigenous scholarly and scientific communities, as they grow in strength, may be in a firmer position to argue for autarkic policies that an economist might characterize as import substitution.

Tightened conditions on the conduct of research or restrictions on the range of acceptable subjects form another class of growing difficulties. Again, this sometimes must be reckoned as highly positive and in the interest of all parties. That is the case, for example, when project approval is made contingent on the involvement of host-country collaborators or trainees. But other attached conditions are more controversial, such as the exclusion of research with a potentially negative bearing on matters of national "image." Perhaps the one common ele-

ment—a natural concomitant of increasing sophistication on the part of host countries—is the introduction of a greater element of selectivity, to be used consciously as a lever for national advantage.

We should not be surprised that there may be feelings of rivalry on the part of national scientific elites that have grown rapidly in the postwar period. In any long-term view this is a merely transitional difficulty. Much more significant is the gratifying development of new management capabilities and of a potential for genuine international collaboration among colleagues of equal scientific stature. Not a few of the restrictive requirements—such as insistence on host-country participants or on the bilingual publication of reports—are also in the long-term best interests of a balanced international development of science. And it is at least understandable that many countries, in these fiscally perilous times, should insist that foreign efforts be focused on research problems having some national development priority.

As this suggests, the impact of restrictions on different fields of scholarship also is highly irregular and difficult to generalize about. Humanists, especially when pursuing themes that are neither contemporary nor controversial, have on the whole been least affected. In the sciences, field access for biologists has become significantly more difficult than laboratory access for physical scientists. Perhaps most heavily affected are the social sciences. Certain whole areas of investigation are widely excluded, seemingly posing the threat of contributing to internal unrest or casting doubt upon an idealized national image. Other areas of investigation are selectively tolerated or encouraged, evidently being viewed as relevant to the implementation of development plans, or even—this has been the justification for some of my own archaeological work—relevant to the formation of new national identities. Beyond a palpably growing restrictiveness, many of these tendencies defy smooth generalization. No doubt the qualities and qualifications of the individual researcher are still the single, most significant variable.

The larger point is that we must not allow ourselves to view only in terms of our own grievances and objectives what is admittedly a growing problem. There is a beam in our own scientific eye also. Sustained, sensitively pursued, multilateral research has not been adequately recognized in our country as a priority in either government or university circles. Mechanisms to encourage such research or to impose a degree of discipline on a small handful of egregious “bad actors” are distinguished largely by their absence. As competition has

sharpened for funding research or graduate-level training, support has eroded for the inclusion of foreign collaborators, for the support of foreign research assistants, or for the bilingual publications that are often necessary to make truly collaborative research a reality. To cite a particularly distressing example, little or no national concern is evident for the catastrophic decline in Mexico's economic abilities to provide access for its best students to American graduate-level training or even to maintain its subscriptions to foreign research journals.

Having some bearing on the general climate of the access question is the withdrawal of the United States from UNESCO at the beginning of 1985. This was certainly justifiable in many respects. The United Nations organization's politicization and unresponsiveness to widely voiced criticisms may have left our government with no other realistic alternative. But our severance of that relationship intensifies many of the other problems to which I have referred.

Whatever UNESCO's gross managerial and intellectual deficiencies, in many areas it is the only intergovernmental agency with responsibility for maintaining the basic infrastructure of international agreements under which cultural and educational programs as well as scientific research can go forward. That applies to global observational programs such as the Man and Biosphere Program, the International Geological Correlation Program, and the International Hydrological Program; it also applies to key elements of support for the International Council of Scientific Unions and the International Council of Museums. Whether or not we choose to reconsider the withdrawal decision itself in the near term on the basis of subsequent changes within UNESCO, we should not be under any illusions as to the continuing adverse effects of withdrawal on the United States scientific community.

Among the programs I have mentioned, the Smithsonian has a particularly direct stake in the one concerned with Man and Biosphere. We have recently launched an integrated set of biotic inventory, research, and training activities under its general auspices. Dr. Terry L. Erwin, one of the Institution's senior entomologists, has been named to head an effort that brings together our interests in biological diversity in the tropics. The plan includes designing methods (based on micro-computer technology) for the long-term monitoring and collecting of data from areas designated as Biosphere Reserves, and for the training of Third World biologists and conservationists in part through their participation in this effort.



On July 1, 1986, the National Air and Space Museum celebrated its tenth anniversary with a host of activities, including photo opportunities in the cockpit of an F-100 Super Sabre jet.

There is the further consideration of general climate or background that should not be overlooked in dealing with all international relationships in scientific and scholarly research. The progress of research may never have been so rapid as it is currently—in the developed, industrialized part of the world. Much of this progress, however, rests on enormous but very costly advances in instrumentation. This raises formidable barriers to effective participation by less favored countries, incidentally making it more difficult for them to retain their Western-trained scientific cadres. Another striking trend, applying particularly to areas of most active ferment, involves the increasingly multidisciplinary character of research. The exciting if also controversial recent discoveries concerning iridium anomalies and the significance of Cretaceous-Tertiary and other extinctions, for example, have involved geologists, geophysicists, crystallographers, astronomers, astrophysicists, meteorologists, paleontologists, evolutionary biologists, and statisticians.

What this means is that having a national scientific community of considerable breadth and balance as well as size is tending to become a condition for national participation in some of the most promising scientific areas. As a result, less-developed countries are faced with the

challenge of having to run faster merely to retain their present places in the world pecking order—at a time when worldwide terms of trade and patterns of indebtedness often prevent them from doing so.

Individual United States researchers with Third World interests prove to have little bargaining leverage in overcoming the access problems I have cited, no doubt in large part because their interests and institutional bases are so diverse. Carefully monitored and balanced reciprocal arrangements, carried on under national or quasi-national auspices, are one obvious solution to the problem. This solution has been usefully applied to United States scholarly exchanges with the Soviet Union. Scholarly relations with the People's Republic of China, on the other hand, are generally acknowledged to be at a stage where reciprocity must be virtually set aside until the relationship develops further. So it is with many less-developed countries as well.

The emergent pattern of tying foreign research more and more closely to the individual country's development priorities will probably prevail for an extended period. Insofar as this pattern leads to an emphasis on research in highly applied, practical areas, the Smithsonian may encounter increasing difficulties. But it may also lead to



Secretary Robert McC. Adams and Vice President George Bush congratulated outgoing Chancellor Warren E. Burger on his receipt on September 14, 1986, of the Smithsonian Medal and citation. (Photograph by Eric Long)

a new stress on research with a training component; in this we have important advantages. With substantial pre- and postdoctoral fellowship programs already flourishing without restriction as to national origin, with capabilities for organizing museum exhibitions that will travel widely in this country, and with practical training programs in fields like museum management, the Smithsonian is in a strong position to bargain for research access with trade-offs not necessarily limited to a particular project or discipline.

Our Directorate of International Activities will have a vital part to play in overseeing these new arrangements. To the extent that adequate funding can be found, the Directorate will facilitate international network building by structuring conferences and workshops within the fields of Smithsonian interests. I do not think I am unreasonably optimistic in expecting that in this way we may make a material contribution to solving the larger problems of research access also.

I touched earlier on the National Forum on Biodiversity as a reaffirmation of an old and valued linkage between the Smithsonian and the National Academy of Sciences. Still another linkage of great promise is our jointly sponsored National Science Resources Center, now housed in the Arts and Industries Building under the directorship of Dr. Douglas Lapp. In addition to support from the Academy and the Smithsonian, funding for the center has been obtained from government agencies, private foundations, and industrial corporations. Dr. Lapp, whose academic background is in physics and biophysics, has been extensively involved in large-scale science curriculum development projects.

The National Science Resources Center is designed to identify, develop, and disseminate scientific and mathematics resource materials that are imaginative, classroom tested, and scientifically up to date. It will also sponsor programs to help teachers learn to teach science and mathematics more effectively at the primary and second-

ary school levels. Many local and regional activities are already under way, of course, to halt the deterioration of instruction in these fields of critical national importance. Our intent is to augment these activities and stimulate the flow of information among them rather than to replace them. Access to much of the finest scientific and engineering talent in the country is possible through the National Academy of Sciences' networks, while the Smithsonian staff adds important experience of its own and insights into alternative, museum-based improvements in learning. The National Science Resources Center's objective is, in short, to provide a format for ongoing collaboration between teachers and scientists. Academy and Smithsonian groups together need to be involved if there is to be a successful national effort not only to test and introduce new models of instruction but to assure their wide dissemination.

I am completing these lines at the very time that master masons are painstakingly finishing the exterior facing of polished granite on the majestic entrance pavilions to the quadrangle, just to the south of the Smithsonian Castle. Below ground, most staff members of the National Museum of African Art and the new Arthur M. Sackler Gallery containing collections of Near Eastern and Asian art have already taken up occupancy in the upper two floors of echoing, still-empty galleries in this splendid museum complex. On a floor lower, the newly furnished offices of the Resident Associate and National Associate programs, of the Smithsonian Institution Traveling Exhibition Service, and of the Directorate of International Activities are also humming with activity.

Depending on whether or not you care to count in composites, one or several major new additions to the Smithsonian family are coming alive. Their public opening during the coming year will shift the central focus within the Smithsonian as a whole, and almost certainly in the following annual reports, from the sciences to the arts. If this has been the year of the forest, next will be the year of the dragon, or perhaps the mask. We change directions, taking up new challenges. But the underlying aim of the Smithsonian always has been to balance growth with continuity.

Staff Changes

As in the past, the comings and goings among the executive staff have continued to have a profound impact on the Institution, but no change at that level was more significant than the retirement of the Smithsonian's fifteenth

Chancellor, Chief Justice Warren E. Burger. Chancellor Burger had overseen what will undoubtedly be regarded as the Institution's greatest period of growth, and to him the staff owes a particular debt of gratitude for his unexcelled dedication to the integrity of the Smithsonian and its Board of Regents. While his absence from the official business of the Board will be sorely felt, we can more happily anticipate continued collaboration with Chief Justice Burger as the chairman of the Commission for the Bicentennial of the Constitution and occasional further service to the Institution as Chancellor Emeritus.

We have been pleased this year to have attracted and begun working with a number of bright and accomplished new members of the senior staff. In midwinter Tom L. Freudenheim came from the Worcester (Massachusetts) Art Museum to the position of Assistant Secretary for Museums. Shortly thereafter, Richard Siegle came from the state of Washington to head the Smithsonian's Office of Facilities Services; Robert Hoffmann left the University of Kansas to become director of the National Museum of Natural History; Mary Case came from the IBM Corporation to serve as the Smithsonian's Registrar; and Nancy Suttentfield left the state of Virginia to become director of the Office of Programming and Budget. It has been a pleasure to begin working with these enthusiastic new staff members who bring a wealth of talent and fresh perspectives which will benefit the Institution for years to come. In a similar vein, we were pleased to appoint to higher positions two well-known and widely regarded staff members, Roberta Rubinoff as the director of the Office of Fellowships and Grants, and Shireen Dodson as Comptroller of the Office of Accounting and Financial Services.

Of course, some of these changes and others were accompanied by the departure of a number of loyal staff whose contributions will have lasting effects. Retirements have taken from our midst Bill Richards, most recently our acting Assistant Secretary for Museum Programs; Jim Mahoney, the director of the Office of Exhibits Central; Al Goff, the director of our Office of Accounting and Financial Services; and Bill Klein, the longtime director of the Rockville facility of the Smithsonian Environmental Research Center. Off to other pursuits are Walter Boyne, director of the National Air and Space Museum; Robert Maloy, director of the Smithsonian Libraries; Al Rosenfeld, director of the Office of Public Affairs; and Tom Peyton, director of the Office of Facilities Services. To all of them, and to many other staff members who have recently departed, we owe hearty thanks for jobs well done and extend our best wishes.

This winter, on three separate occasions, we took a moment to honor the notably outstanding services of three of our most dedicated colleagues. Receiving the Secretary's Gold Medal for Exceptional Service were Tom Peyton, Betty Meggers, and Adelyn Breeskin. During the summer, however, we were saddened to learn that Mrs. Breeskin, who had just turned 90, died while traveling abroad.

It continues to be undeniably true that the greatest strength of the Institution is in its staff. I am even more aware of that fact as I complete my second year as Secretary, for at every turn, day in and day out, I am continually struck by the enthusiasm and devotion of Smithsonian employees too numerous to name.

The Year in Review

The Smithsonian's tallies for fiscal year 1986 show that members of the public paid an estimated 22.7 million visits to Smithsonian facilities during the year. But the visitor statistics for the Smithsonian's thirteen museums and the National Zoo represent only a portion of the many contacts and exchanges between the Smithsonian and its audience.

For example: 1.2 million people came to the Festival of American Folklife this summer, Smithsonian Institution Traveling Exhibition Service exhibitions were viewed by five million people in the United States and abroad, seven million people read *Smithsonian* magazine, eight million viewers watched "Smithsonian World" on their local Public Broadcasting stations, and a potential four million listeners tuned in to "Radio Smithsonian." The 1,550 daily and weekly newspapers that subscribe to the Smithsonian News Service have a combined circulation of forty million, and it has been estimated that 50 percent of the prime-time television viewing audience is reached by the "Here at the Smithsonian" short features.

The Resident Associate Program now has 57,000 members, and the records show that 270,000 adults and young people attended RAP's 2,000 activities in fiscal year 1986.

The Smithsonian National Associates Lecture and Seminar Program invited 445,000 families in cities across the United States to participate in regional programs.

Study tours took 6,600 Smithsonian Associates on adventures that ranged from retracing the sailing routes of Magellan, Drake, and Darwin to hiking the sacred peaks of China to studying history and art in Florence, Italy.

The Visitor Information and Associates' Reception Center reported a 35 percent increase in phone traffic as telephone information services logged more than 400,000 calls, and reported a 33 percent increase in inquiries to the public inquiry mail service, yielding 50,000 pieces of mail.

Hundreds of visiting scholars were welcomed to the Institution for brief visits and lengthy residencies, enriching both their own experience and that of the Institution with their presence.

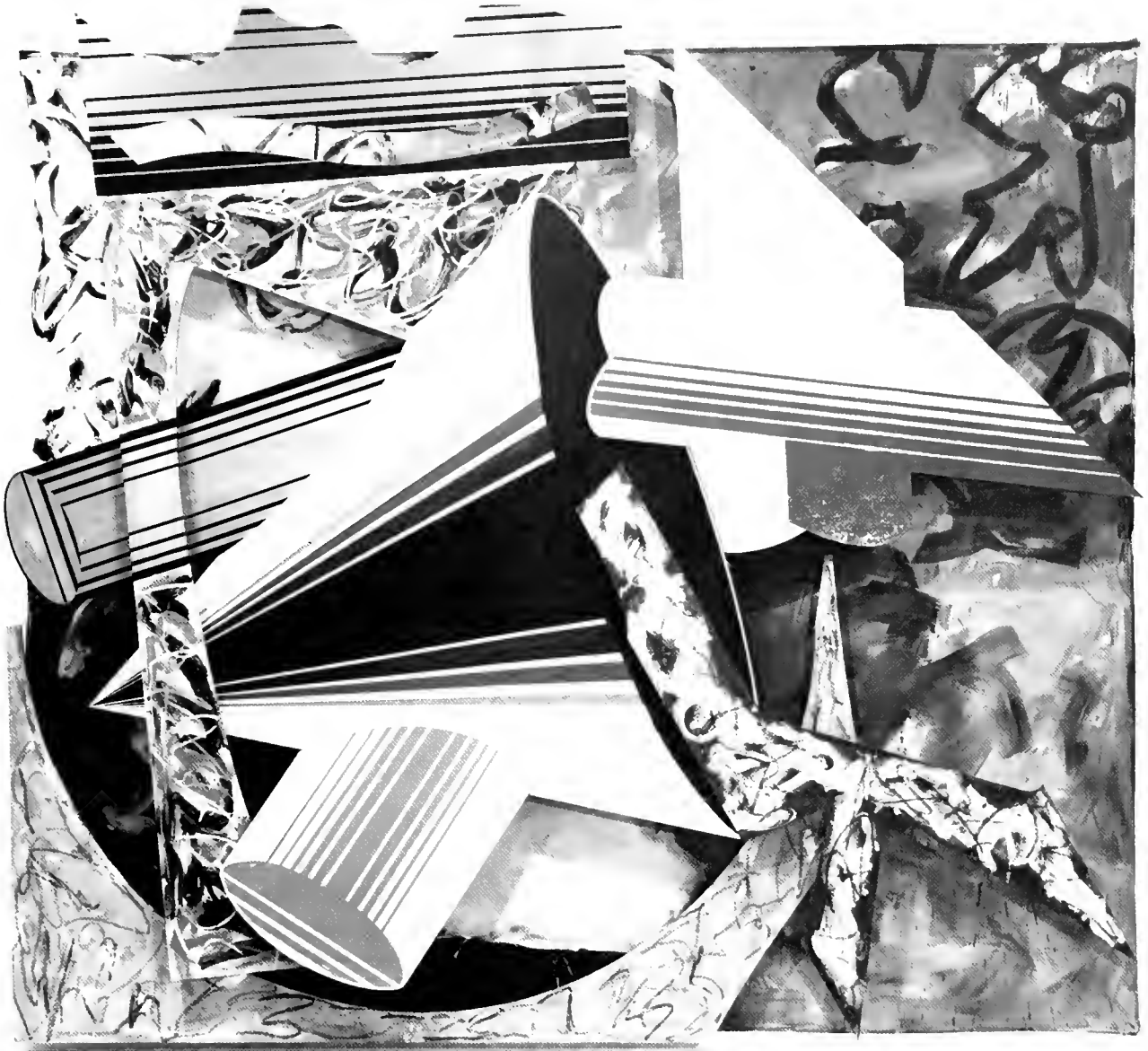
Last, not least, among the vital statistics for fiscal year 1986 are the 5,546 volunteers who supported the Institution with their energy and time in performing a wide range of essential services—working in the Visitor Information and Associates' Reception Center, serving as docents and tour guides, engaging in research, feeding the tarantulas at the Insect Zoo, making Christmas ornaments, and producing the Washington Craft Show, to name but a few services performed by Smithsonian volunteers.

The more than 125 exhibitions that opened in 1986 included blockbusters and small gems. A sample reveals the variety of Smithsonian offerings.

The Smithsonian looked back at its own beginnings in the National Museum of Natural History's yearlong exhibition, *Magnificent Voyagers: The U.S. Exploring Expedition, 1838–1842*. Critically acclaimed as both exhibition and book, *Magnificent Voyagers* commemorated an expedition that made enduring contributions to scientific knowledge. Thousands of specimens and artifacts—mostly from the Pacific Islands and the west coast of North America—were turned over to the Smithsonian in 1857, becoming the foundation for the National Museum of Natural History's study collections.

More than forty institutions and individuals loaned materials for this massive undertaking. Production of this exhibition and the programs accompanying it involved close cooperation among many Smithsonian organizations, including various curatorial departments within the Natural History Museum and the museum's Office of Education, as well as the Joseph Henry Papers, the National Museum of American History, the Smithsonian Institution Libraries, the Smithsonian Institution Press, the Smithsonian Archives, and the Smithsonian Institution Traveling Exhibition Service. The show will travel throughout the United States for two years.

At the Freer Gallery of Art, *From Concept to Context: Approaches to Asian and Islamic Calligraphy*—the muse-



Frank Stella's relief painting *Quaquà! Attaccati là!*, 1985, was acquired by the Hirshhorn Museum and Sculpture Garden this year as a museum purchase.

um's first comprehensive look at an art which, in Asia and the Near East, is considered to represent the pinnacle of creative achievement—was held in conjunction with the 26th International Congress of the History of Art, held in Washington, D.C. The Freer recorded a 50 percent increase in attendance this year.

Important exhibitions at the Hirshhorn Museum and Sculpture Garden included *A New Romanticism: Sixteen Artists from Italy*, the first exhibition in America to explore the romantic spiritual impulse of recent Italian art, and *Directions 1986*, the latest in a series focusing on developments in contemporary art.

The National Zoo brought out the first in a series of interactive exhibits, called ZOOArk, designed to provide visitors with in-depth information. The Zoo also experimented successfully with mixed-species groupings, placing hummingbirds and predatory fishes in crocodile exhibits, and birds with a variety of mammals in the Small Mammal House.

The Anacostia Neighborhood Museum's last exhibition in its old building was a tremendous success. Museum attendance increased 50 percent during the showing of *The Renaissance: Black Arts of the Twenties*, which was accompanied by a wide range of educational programs.

Exhibitions at the National Museum of American Art's Renwick Gallery included *Frank Lloyd Wright and the Johnson Wax Buildings: Creating a Corporate Cathedral*. For the first time in almost ten years, visitors to the gallery could see the Renwick unobstructed by barriers and scaffolding, as repairs of the façade were finally completed.

Noteworthy National Portrait Gallery exhibitions included *Gaston Lachaise: Portrait Sculpture* and *John Frazee, Sculptor*, the latter coorganized with the Boston Athenaeum.

The Cooper-Hewitt Museum in New York City offered a varied menu to museum-goers, including *Bon Voyage: Designs for Travel; Advertising America; Treasures from Hungary: Gold and Silver from the Ninth to the Nineteenth Century*; and *Toys from the Nuremberg Spielzeug Museum*.

Among the exhibitions produced by the National Museum of African Art, before it closed in order to move to the new underground museum complex on the Mall, was *Go Well, My Child*, which consisted of photographs of South Africa donated to the museum by photographer Constance Stuart Larrabee, who forty years ago collaborated with Alan Paton to create a photographic portfolio

based on his novel *Cry, the Beloved Country*. Another important Museum of African Art show, *A Human Ideal in African Art, Bamana Figurative Sculpture*, was based on recent field research in Mali. The exhibition is the first organized by the museum to travel to New York's Metropolitan Museum of Art.

Each year, traveling exhibitions make it possible for hundreds of thousands of people outside of Washington, D.C., to view Smithsonian productions.

The National Museum of American History was the first stop on the tour of the tremendously popular SITES show *Hollywood: Legend and Reality*, the first major exhibition to explore the development of the film industry and its aesthetic and cultural impact on American society. In fiscal year 1986, the Smithsonian Institution Traveling Exhibition Service added twenty-five exhibitions to its roster of more than one hundred traveling shows.

Three of the National Museum of American Art's 1986 exhibitions will tour to other American cities: *Treasures from the National Museum of American Art*, which includes eighty-one of the museum's most important works; *Art in New Mexico, 1900-1945: Paths to Taos and Santa Fe*, the first major East Coast exhibition devoted to the subject; and *Art, Design and the Modern Corporation: The Collection of the Container Corporation of America*.

Several museums have added to their permanent exhibitions.

Visitors to the National Museum of Natural History can now see Earth's oldest fossils in the new permanent exhibition *The Earliest Traces of Life*.

The National Museum of American History opened the first in a series of new permanent installations, *After the Revolution: Everyday Life in America, 1780-1800*. The exhibition draws on recent scholarship and research to present a cross section of American life of the period.

The National Air and Space Museum also opened the new Looking at Earth gallery that draws on the expertise of the museum's Center for Earth and Planetary Studies in the field of remote sensing. Illustrating the many ways that man has viewed the Earth, the gallery highlights pigeon-carried cameras as well as satellite-carried devices.

At the National Museum of American Art, the Doris

M. Magowan Gallery of Portrait Miniatures reopened after being closed several years for extensive renovation.

The Smithsonian continued to take an active role in the nationwide Festival of India 1985–1986, a celebration of Indian culture bringing art, music, drama, dance, film, and crafts to major cultural institutions across the United States. Smithsonian Secretary Emeritus S. Dillon Ripley is American Chairman for the festival.

Golden Eye: An International Tribute to the Artisans of India, at the Cooper-Hewitt Museum in New York City, displayed furnishings, jewelry, objets d'art, toys, clothing, and architectural elements designed by eleven noted Western designers inspired by the traditional crafts of India. All the items in the show were crafted by artisans in India.

The National Museum of American History offered two exhibitions in conjunction with the festival. *Aditi: The Monies of India* examined the history of money in India from the sixth century B.C. to the present, and *All Sorts of Painted Stuffs . . . Indian Chintzes and Their Western Counterparts* explored the production of India's exotic, floral-patterned cottons and their arrival and imitation in the West.

The Smithsonian Institution Traveling Exhibition Service produced *The Master Weavers*, an exhibition of the varied traditional textiles of India.

The National Museum of American History's Office of Education created an educational kit, *The Living Arts of India*, which is circulating among South Asian centers, universities, centers for international education, and school systems across the United States. Accompanied by six volumes of written material, the package includes audiotapes and a videotape of the museum's 1985 *Aditi: A Celebration of Life* exhibition, as well as puppets, posters, musical instruments, and more.

The spirit of international cooperation and exchange embodied in an event like the Festival of India 1985–1986 has long been a part of the Smithsonian's mission. This spirit continues to grow and find expression in ongoing Smithsonian activities and in our plans for the future.

As construction of the Smithsonian's new museum complex on the National Mall neared completion, the Smithsonian Institution Traveling Exhibition Service, the Resident and National Associate programs, and the Directorate of International Activities moved into the

underground facility during 1986 and attention focused on preparations for the opening of the Arthur M. Sackler Gallery and the International Center, and the reopening of the National Museum of African Art, in September 1987.

In addition to coordinating a wide range of ongoing projects involving international cooperation between the Smithsonian and other institutions, staff members of the Directorate of International Activities have been planning for the International Center's inaugural exhibition and associated programs—and also for the Columbus Quincentenary in 1992. In 1986 the Directorate began a three-year pilot program, in cooperation with the National Museum of Natural History, tied to the international Man and the Biosphere Program.

Also in 1986 the Directorate of International Activities joined with the Joint Committee on Africa of the Social Science Research Council and the American Council of Learned Societies to survey scholars and museum professionals worldwide on issues to be discussed at a future international conference on African material culture. As planned, the conference will integrate the perspectives of multiple disciplines.

The National Museum of African Art began a new chapter in its history on June 15, 1986, when the doors of its Capitol Hill townhouses closed and preparations for the move to the new site on the Mall began. The Smithsonian Archives completed its survey of the Eliot Elisofon Photographic Archives, one of the largest photographic archives of African art, culture, and environment, and a major research component of the National Museum of African Art.

Smithsonian Institution Libraries' National Museum of African Art branch continued purchasing to enhance the Africana collection, which has doubled in size to more than 10,000 volumes since 1985. And the museum's Department of Education and Research has doubled the size of the museum's docent corps, assembling eighty volunteers for a training program that will prepare them and the department for the inaugural programs at the new location.

The center for Asian art, which includes the Arthur M. Sackler Gallery and the Freer Gallery of Art, experienced a 50 percent growth in staff this year. Center conservators and staff at the Smithsonian Conservation Analytical Laboratory worked to prepare the Arthur M. Sackler collections for exhibition.

Scholarship at both the center for Asian art and the Museum of African Art has been enhanced with the con-



Somewhere there is a book that will challenge a child to read and through reading to expand horizons and break down limits on learning. These children were looking for "their" books at the Smithsonian, following a drawing to select a National RIF Reader. (Photograph by Dolores Neuman)

tinuation of the Rockefeller Residency Program in the Humanities grants for postdoctoral fellowships. The 1986 fellows are studying, respectively, historical photographs as sources for research on African art history and history, and Persian sources relating to the calligraphers, artists, and artisans of the Timurid period.

Meanwhile, above ground, the Smithsonian's Office of Horticulture began installing trees and plants in the Enid A. Haupt Garden, which is to open in spring 1987.

The Smithsonian celebrated several milestones during fiscal year 1986.

Smithsonian Archives honored the 100th anniversary of the birth of Alexander Wetmore, sixth Secretary of the Smithsonian Institution, with the exhibition *Alexander Wetmore: The Early Years, 1900-1925*. The exhibition included a narrated videotape of film footage of Wetmore's 1950s Panama expeditions.

The Cooper-Hewitt Museum celebrated the 10th anniversary of its rebirth as the Smithsonian's National Museum of Design on October 6, 1985.

The 10th anniversary of the opening of the National Air and Space Museum was celebrated on July 1, 1986.

This has been a decade of record-breaking attendance, a full schedule of public programs, and an expanded commitment to historical and scientific research. The museum's collection has come a long way since a group of Chinese kites was given to the Institution in 1876; this year, NASM acquired the Space Shuttle Enterprise, which will serve as centerpiece for the proposed museum annex at Washington Dulles International Airport. Other landmarks in this anniversary year were the launching of the *Air & Space / Smithsonian* magazine and accompanying membership program, and the premiere of the new IMAX film *On the Wing*.

Two divisions in the National Museum of American History marked their 100th anniversaries this year. The National Philatelic Collection was honored by the U.S. Postal Service, which issued a special booklet of stamps to commemorate the collection's centenary. And the museum's Division of Graphic Arts celebrated with the exhibition *GA 100: The Centenary of the Division of Graphic Arts*.

In addition to marking its own anniversaries, the Smithsonian joined in the celebrations of other national and international milestones.

In conjunction with the centennial celebration for the Statue of Liberty, the Office of Smithsonian Symposia and Seminars held a colloquium, "Liberty: As Idea, Icon, and Engineering Feat," in New York City.

The National Portrait Gallery joined with the Tennessee State Museum to produce the exhibition *Davy Crockett: Gentleman from the Cane*, commemorating the bicentenary of the folk hero's birth.

The National Museum of American History commemorated the 150th anniversary of the Patent Act with the exhibitions *Patent Pending: Models of Invention and Invention and Enterprise*.

The Cooper-Hewitt Museum presented the exhibition *Milestones: Fifty Years of Consumer Goods and Services* on the occasion of the 50th anniversary of Consumers Union, publishers of *Consumer Reports* magazine.

The Smithsonian Institution Traveling Exhibition Service produced *Carnegie Libraries: A Sesquicentennial Celebration*.

The winter of 1985 saw the return of Halley's comet, a cause for excitement worldwide. Smithsonian Astrophysical Observatory scientists were involved in research concerning the 1985-86 appearance of the comet, including measurements of the nucleus, the first glimpse ever of the heart of a comet. These measurements confirmed

and extended the famous “dirty snowball” model of a comet’s nucleus developed by the Observatory’s Fred Whipple.

The National Air and Space Museum produced a variety of programs for comet watchers: *Comet Quest*, the most successful planetarium show to date; a curriculum guide; a permanent installation, *Exploring Comets*; an exhibition, *Fire and Ice: A History of Comets in Art*, which drew on collections from around the world; and a one-day free public celebration including an international symposium, a lecture by astronomer Carl Sagan, and a “Once-in-a-Lifetime” party.

At the Freer Gallery of Art, the exhibition *Wonders of Creation, Oddities of Existence: An Exhibition in Celebration of Halley’s Comet* offered visitors a view of Near Eastern attitudes toward the cosmos from the thirteenth to the eighteenth centuries. The Smithsonian Associates set forth on a variety of study tours. And the Visitor Information and Associates’ Reception Center reported that interest in Halley’s comet in November and December generated nearly 19,000 calls to the Dial-a-Phenomenon recording.

The Smithsonian continues to add to the national collections it holds in trust for the American people. In 1986, ten of the Smithsonian’s thirteen museums and the National Zoo took in an estimated 942,000 artifacts, works of art, and specimens. The bulk of the new acquisitions—approximately 896,000 male, female, old, and young specimens from different parts of the world—went to the National Museum of Natural History, where specimens are collected by the thousands so that scientists may have statistically valid sample populations to study.

All together, the Smithsonian museums now have more than 102 million objects in their collections. Some, especially works of art, are purchased; other objects and specimens are brought back from scientific expeditions and fieldwork conducted by researchers.

Among the more than 40,000 items that found their way into the collections of the National Museum of American History this year were more than 300 hand-held calculators; the “Indomitable,” the first magnetic resonance imaging device, which allowed doctors for the first time to examine the entire human body internally using ultrasound technology rather than surgical intervention; vaudeville costumes worn in the 1890s; and a Kodak Brownie camera used to photograph the rescue of *Titanic* survivors.

The Arthur M. Sackler Gallery added the finest exist-

ing private collection of Islamic and Indian paintings and manuscripts to its already precious holdings. This long-lost collection, assembled between 1900 and 1943 by Paris jeweler Henri Vever, is a comprehensive survey of the art of the Persian book.

The Freer Gallery of Art acquired a nineteenth-century Chinese wooden birdcage with lacquer and ceramic accessories as well as three works of Japanese calligraphy and an ancient Chinese pottery ewer or vessel from the Warring States period (481–221 B.C.). A gift of Chinese blue-and-white porcelains (1662–1722), now on exhibit in the Peacock Room, were also added to the collection.

The National Portrait Gallery acquired a formal full-length oil portrait of President Jimmy Carter, an oil painting of poet T. S. Eliot, and a group of caricatures of famous Americans by Herman Perlman. The gallery also added to its collection another eighty-two pieces of original art used for *Time* magazine covers.

Marine biologists at the National Museum of Natural History welcomed the addition of a 4,000-specimen algae collection from the Florida Keys and the Bahamas. Entomologists received 10,000 moths and butterflies from Scandinavia, including specimens previously unrepresented in the museum’s extensive collections. One of the largest complete trilobites ever found in North America was added to the museum’s fossil collection—and beautiful crinoid, or “sea lily,” fossils were purchased by the Paleobiology Department. A collection of rare, nineteenth-century native wood-carvings was donated to the museum’s Anthropology Department. The Vertebrate Zoology Department received an extensive collection of birds, mammals, and insects from the Amazonian jungles of Brazil. This collection may include species that are new to scientists.

The National Museum of African Art acquired a sculpture, made of wood, metal, shell, and other materials, by the Songye people of Zaire, and purchased a rare Vili (Congo) ivory staff top, a chief’s emblem of office, dating from the nineteenth century or earlier.

Among the twenty-two works added to the Hirshhorn Museum and Sculpture Garden collections were *Dictionary for Building: Closet under Stairs*, a 1985 work by Siah Armajani, and a bronze sculpture by Max Ernst, *Young Flower-Shaped Woman* (1944, cast in 1959). The Hirshhorn also officially acquisitioned 5,879 works of art that had been bequeathed to the museum by its founder, the late Joseph Hirshhorn (1899–1981).

The National Air and Space Museum acquired numerous distinguished medals belonging to General Chuck Yeager, along with two of his flight jackets. One of the

jackets was worn by Yeager on his historic 1947 sound-barrier-breaking flight in the Bell XS-1. A Russian fighter plane, a MiG-15, and a home-built American helicopter also were added to the museum's aeronautics collection. NASM's Space Science and Exploration Department received the only full-scale test vehicle used in 1976 for NASA's Hubble Space Telescope. The real telescope has since been built and is scheduled to be the payload of a future space shuttle mission.

Among the highlights of the 1986 acquisitions made by the Smithsonian's National Museum of Design, the Cooper-Hewitt Museum in New York, were a linen napkin (1905), a 1929 mahogany-and-glass bookcase, and a work by Dutch artist Isaac de Moucheron (1667-1744).

The National Museum of American Art acquired a portfolio of prints by the well-known photographer Diane Arbus; a group of contemporary works by Peter Sollow, Jacob Kainen, James Surls, and Philip Guston, and a neoclassical sculpture by Harriet Hosmer titled *Will o' the Wisp*.

The Smithsonian's Archives of American Art has an extensive collection of materials from artists, museums, and art collectors around the country. In 1986, the Archives added 145 color slides of Chicano murals in Los Angeles, about twenty boxes of files, correspondence, and other materials from the Los Angeles Museum of Contemporary Art, and the personal papers of the well-known *Playboy* artist and illustrator, Alberto Vargas.

Notable among the National Zoo's new acquisitions were ten golden-headed lion tamarins from Brazil. The monkeys became part of the Zoo's ongoing captive-breeding programs, which hope to save these and other endangered species from extinction. New breeding programs were founded in 1986 with the addition of species to the collections. The Zoo's collections also expanded naturally, with 1,265 births—including the first birth of a golden-headed lion tamarin in the United States. Other triumphs in the propagation of rare and endangered species included the first hatching of red-crowned cranes at the Zoo and continued success in the Guam birds rescue project.

Nearly all of the objects acquired by the Institution in 1986 became part of the Smithsonian's study collections. These collections and the curators who study them are unparalleled resources, essential to scholarly research. Making these historical and anthropological objects, original works of art, natural history specimens, living plants, animals, and entire ecosystems available for study

and providing opportunities for research and study to colleagues and students outside the Smithsonian is a vital Smithsonian activity.

In 1986, the Office of Fellowships and Grants welcomed 142 fellows, 256 visiting scientists and scholars, and 101 interns, including representatives of more than thirty foreign countries. The diverse topics for their researches included migration and employment transition of African-American women, 1890-1930; mechanics, mathematics, and machines in the culture of the Renaissance; man and nature in Winslow Homer's Adirondack pictures; kinetics and ecology of flight in butterflies; technology, gender, and economics in computer programming; and the introduction of modern German art into New York City, 1905-39.

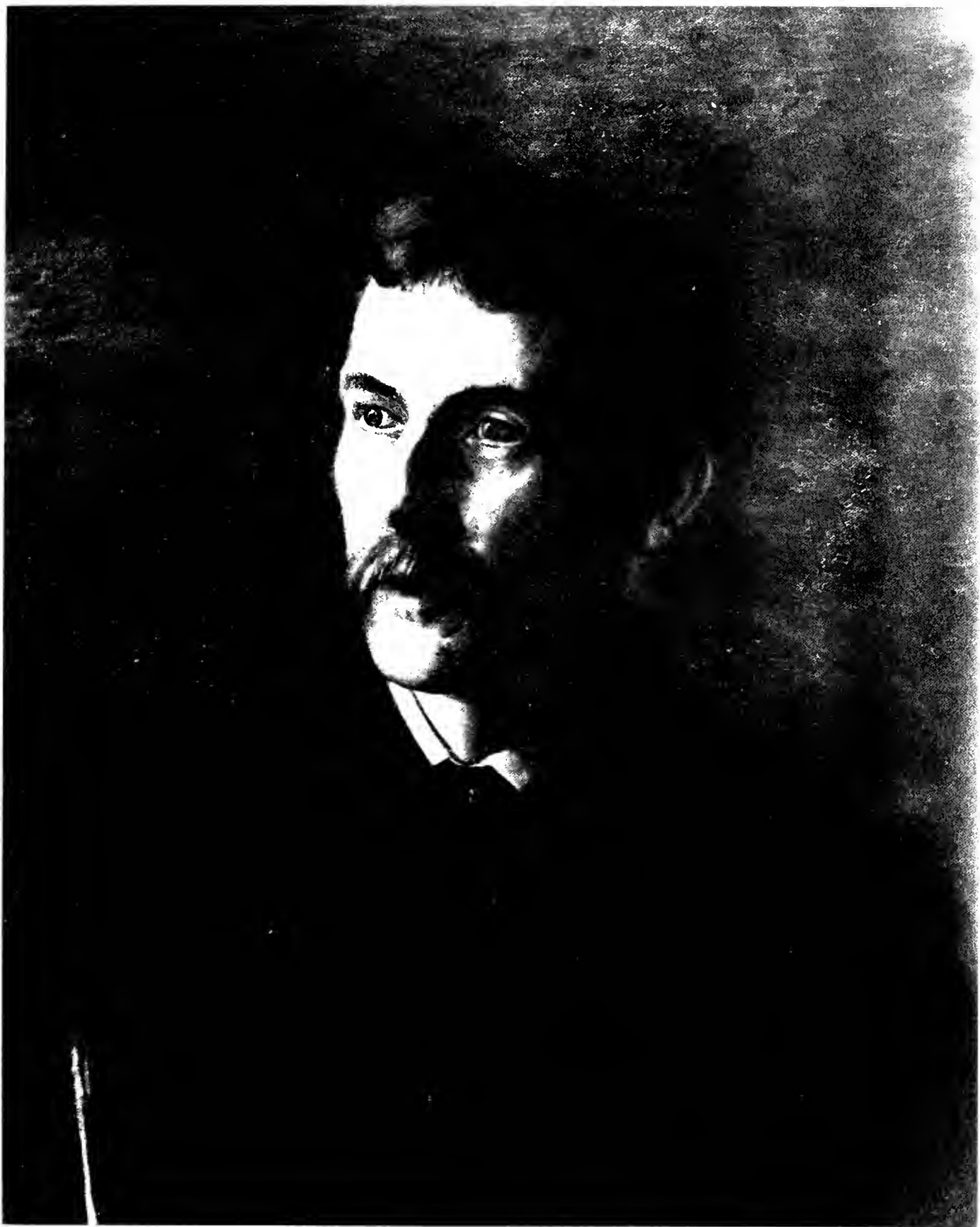
Fellows at the Smithsonian Tropical Research Institute totaled 73 men and women from the United States, Asia, and Latin America, many of them from developing nations.

The Office of Museum Programs continued to provide services to museums, as well as internships and opportunities for visiting professionals, museum leaders, and specialists from across the United States and overseas. Its many activities in 1986 included an International Congress on Learning in Museums; a joint on-site workshop with the African American Museums Association for teams of museum directors and trustees; a national conference on Women's Changing Roles in Museums, co-sponsored by the Office of Museum Programs and the Smithsonian Institution Women's Council; and the Native American Museums Program which included the Native American Archives Advisory Conference.

The Office of Elementary and Secondary Education this year expanded its programs for young people and educators, including the Career Awareness Program; the Summer Intern Program; "Exploring the Smithsonian," which welcomed 5,400 Washington, D.C., junior high school students; and the Summer Internship Program for High School Teachers from across the nation.

The year 1986 saw several additions to the Smithsonian's ongoing efforts to encourage a wider audience participation and to reflect in its programs the contributions of all cultural communities to history and culture.

The National Museum of American Art produced two new special-interest self-guided exhibition tours, "Afro-American Art" and "Women Artists." The Office of Public Affairs has expanded the scope of its readership by launching a Hispanic edition of the Smithsonian News



The National Portrait Gallery's purchase of this painting by Thomas Eakins of Talcott Williams, an oil on canvas, was made possible by the James Smithsonian Society and the Kate and Laurens Seelye Family. (Photograph by Eugene Mantie)

Service. A variety of public programs, such as the Festival of American Folklife and the National Museum of American History Program on Black American Culture colloquia and concerts on Classic Gospel Song and Black American Popular Music, provided opportunities for visitors to learn about the different cultural traditions that compose our heritage.

The American Indian Program at the National Museum of American History and the National Museum of Natural History was established in fiscal year 1986 to bring American Indian perspectives to all of the museums' publications, outreach, and exhibition projects.

The Office of the Committee for a Wider Audience was established in June 1986, formalizing the work of the ad hoc Committee for a Wider Audience. The office will evaluate Smithsonian programs and recommend ways to improve the Institution's capacity to serve a more varied and diversified American and international public.

Since successful wider audience participation is ultimately related to excellent scholarship and interpretation, these concerns are also being addressed behind the scenes at the Smithsonian.

This year marked the fifth year that the Office of Fellowships and Grants offered a wide range of academic opportunities aimed at increasing minority participation in Smithsonian programs. These opportunities include internships for minority undergraduate and graduate students; a student employment program that encourages minority graduate students to work in professional and administrative positions; an Education Fellowship Program that offers support for graduate education and research training at the Smithsonian; and fellowships for minority faculty members and faculty from minority colleges. Faculty research topics this year included the development of the synthetic dye industry in the United States, 1860–1920; the role of sports in Afro-American community life during the Jim Crow era, 1896–1954; and salinity tolerance assessments of mangrove ferns.

The Office of Fellowships and Grants American Indian Program provides opportunities through directed and independent appointments for North American Indians to pursue research utilizing Smithsonian collections relating to their cultures. In 1986, research topics included the National Congress of American Indians and its involvement in American Indian Higher Education; and Chippewa Musical Heritage and Reservation History.

The Office of Fellowships and Grants initiated the

Visiting Associates Program in 1986. A dozen university and college faculty and administrators who have a commitment to expanding minority participation in higher education visited the Institution to learn about ongoing research and research opportunities. Associates were asked to serve as resource contacts and will disseminate Smithsonian research opportunities to their respective academic communities.

In conjunction with the Association of American University Presses, the Smithsonian Institution Press in 1986 helped establish a nationwide program to increase the number of minority members in university press publishing.

Paving the way for future specialized research are such programs as the Afro-American Index Project, which began in December 1985 to record the tens of thousands of Afro-American related objects, photographs, and documents in Smithsonian collections, and the Smithsonian Ethnographic Judaica Project, which similarly began cataloging ethnographic objects, documents, and ceremonial art in Judaica collections.

The National Museum of Natural History joined with the American Institute of Biological Sciences and the National Science Foundation to produce the International Grass Symposium. Proceedings of this major symposium are in preparation for publication by the Smithsonian Institution Press.

"Man and Beast Revisited," an international symposium cosponsored by the National Zoo and the Office of Smithsonian Symposia and Seminars, was designed as a sequel to the 1969 "Man and Beast: Comparative Social Behavior."

A survey of significant scientific research at the Smithsonian this year encompasses the development of new visions of the universe and efforts to understand the consequences of man-made disasters.

Smithsonian Astrophysical Observatory scientists challenged and confirmed several long-standing notions about the cosmos in the past year. SAO scientists produced a new map of large-scale structure in the universe. They revised the distance measurement to the center of the Milky Way from 33,000 light years, the standard for two decades, to 23,000 light years. This fundamental measurement affecting many calculations in astronomy will have a major impact on our understanding of the distance between objects in our galaxy. SAO scientists and Harvard collaborators have made the first precise measurements of the distance from Earth to an astro-

nomical object outside our galaxy—a supernova approximately 60 million light years away. This ability to measure extragalactic distances is central to many cosmological issues, including size, age, structure, and ultimate fate of the universe.

In addition to these breakthroughs in measuring distance, SAO has taken steps to improve the measurement of time as well. An SAO- and Harvard-designed clock that successfully operated at a temperature within one-half degree of absolute zero is expected to be *one thousand times* more accurate than previous atomic clocks.

The Smithsonian Environmental Research Center facility in Rockville, Maryland, completed its fifty-seventh and last year as a site for study of the influence of sunlight on growth and development of biological organisms. When the Rockville center closed in November 1986, research continued at the Edgewater, Maryland, facility. Researchers in Edgewater have been studying Chesapeake Bay overenrichment, a major regional problem, from an over-all landscape perspective. Their findings indicate the significant role played by farm management and the need for improved watershed management in the Bay area.

At the Smithsonian Tropical Research Institute in Panama, scientists are exploring diving and buoyancy in sea snakes; variation in animal genitalia; spider webs; the interrelationships of certain birds and wasps; dynamics of forest growth; and the effects of weather and seasonal rhythms on flora and fauna of the region.

While STRI researchers were analyzing years of data gained from monitoring the environment on the reef flat at Galeta Point, the worst oil spill in Panama's history caused extensive mortality on the flat. Since this is the first oil spill in so well-studied a place, the Department of the Interior expressed interest in following up the effects of the disaster in a study that will span a considerable stretch of the Caribbean coast. Other research at the Institute focuses on the effects of natural disaster, studying how the massive mortality of reef corals in the wake of El Niño is affecting the development of reefs and observing the recovery of the long-spined sea urchins *Diadema* from the mass mortality that reduced their numbers by over 99 percent three years ago.

New projects at the Conservation Analytical Laboratory this year include studies of heat and moisture transport in walls of museum buildings, studies of humidity-induced dimensional changes in woodwind instruments during playing, and studies of the effects of weighting silk. Progress in CAI's studies of yellow-firing Hopi ceramics has attracted a sizable number of requests for col-

laborative projects in American Southwest archaeology. Similarly, the work on ceramics from the Helmand and Indus Valley civilizations was so successful that Italian and French archaeologists working on this subject in the Middle East have expressed the wish for further formalized cooperative arrangements.

CAI's collaborative program with the National Bureau of Standards on lead isotope analysis concentrated in 1986 on Chinese bronze vessels from the Arthur M. Sackler collections and the results were reported at a conference in China. The laboratory also joined with the Getty Conservation Institute and the Canadian Conservation Institute in a study of the effects on museum objects materials of fumigants commonly used for insect control.

The National Air and Space Museum conducted research on the history of cosmic ray physics; the origins of the Hubble Space Telescope; Turkish aviation; the evolution of space suit technology; and the history of airlines in Asia. Data from remote sensing of terrestrial and planetary surface features was used to study desert regions of Earth and structural landforms on Mars. In addition, the museum established the National Air and Space Archives as a national center for research into aerospace history, a clearinghouse for information on the museum's own collections as well as collections available at non-Smithsonian facilities.

National Museum of Natural History scientists investigated the hydrothermal vents of the eastern Pacific and the giant vestimentiferan tube worms that live there. International expeditions went to Colombia to study the aftermath of the catastrophic eruption of Nevada del Ruiz, which killed 24,000 people; to a remote, biologically unexplored offshore area of the Philippines; to the mountains of Nepal to survey a proposed conservation area; and to Morocco, with the National Geographic Society, in search of the ancient Strait of Gibraltar. The museum initiated the first long-term study of a mangrove ecosystem, in Belize, and a major study of a meteorite that may give clues to the earliest history of the solar system. The year 1986 also saw the beginning of the Cooperative Program on the Mexican Apifauna, involving bee specialists from the United States, Mexico, and Panama.

The Smithsonian continued to publish books and records for scholarly and general audiences, and to produce film and television projects that reach an audience far beyond the bounds of Washington, D.C. Among the many achievements in 1986 were these:

The Stone Carvers, a film that grew out of the 1978 and 1979 Festival of American Folklife programs, won an Emmy Award.

"Smithsonian World" received an Emmy Award for the Anne Morrow Lindbergh segment in *Crossing the Distance*, and was honored with the gold medal for best magazine series at the International Television and Film Festival in New York.

The Office of Telecommunications completed the pilot program for a possible children's television series, "Smithsonian Quest," and participated in the production of "Smithsonian Treasures," a 90-minute television special hosted by Gene Kelly and broadcast in April 1986.

Smithsonian bureaus produced a variety of important exhibition catalogs and volumes on current research, among them works honored by the American Association of Museums and other professional organizations. The National Museum of Natural History published the sixth in the Institution's projected twenty-volume encyclopedic *Handbook of North American Indians*.

The Smithsonian Institution Press continued its growth in the publication of scholarly and general books. Three new scholarly series developed rapidly in 1986: New Directions in American Art, the Smithsonian Series in Archaeological Inquiry, and the Smithsonian Series in Ethnographic Inquiry. In all the Press published over thirty-five books in the past year. Several books won design awards and commendations, and Fred Whipple's *Mystery of Comets* was honored with the prestigious Phi Beta Kappa Award. *American Popular Song*, a seven-record anthology produced by the Smithsonian Collection of Recordings, was nominated for Grammy awards in two categories: Best Historical Album and Best Album Notes.

The first meeting of the Board, held on January 27, 1986, began with tributes to the late Regents Emeriti George H. Mahon and J. Paul Austin. At the suggestion of the Executive Committee, the Regents voted to seek the reappointment of Dr. Gell-Mann and Mr. Acheson as Regents of the Institution. The Board received a report of the Audit and Review Committee's November 5, 1985, meeting at the Museum Support Center, in which the committee reviewed programs for the handling of hazardous materials, toured the center, and discussed the activities of the Conservation Analytical Laboratory. The Personnel Committee reported that it had reviewed the financial interests statements of the executive staff, had received a report on the submission and review of other employees' financial interests statements, and had found no conflict of interest whatsoever. After the Regents' ad hoc committee on food services reported its findings, the Regents voted to authorize the Secretary to solicit new bids and contract for Smithsonian restaurant services on and near the Mall, to plan and contract for the construction of a new restaurant facility on the east terrace of the National Air and Space Museum and such other capital improvements to existing facilities as may be prudent, and to finance these undertakings with available unrestricted trust funds or funds to be borrowed from banking institutions. The Investment Policy Committee reported on its meeting in November 1985; subsequent to the meeting of the Board, Mr. Humelsine, acting chairman of the committee, conferred with members of the committee and requested the Treasurer to order the sale of the Institution's holdings in the Trustees' Commingled Fund.

In his Secretary's Report, Mr. Adams reported on the impact of the Gramm-Rudman-Hollings sequestration of fiscal year 1986 appropriations and strategies being developed to cope with these and future cuts. The Secretary also announced measures being taken to partially decentralize the Institution's fund-raising activities; reported that IBM had made a major challenge grant toward *The Information Revolution* exhibition being developed at the National Museum of American History; discussed efforts which had been made to assist the launching of *American Visions* magazine; promulgated a general policy on the loan of particularly important Smithsonian collections; and gave a report on the National Science Resources Center.

In other actions, the Regents received reports on financial matters; approved the *Five-Year Prospectus, FY 1987-FY 1991*; established a policy of minimizing the inconvenience to the general public on occasions of offi-

cial visitors; and received reports on the prospective Air and Space Museum facilities at Washington Dulles International Airport, on the Smithsonian Council's meeting, and on museum deaccessioning during the last fiscal year. The Regents also appointed or reappointed Thomas M. Evans, Robert Morgan, Barry Bingham, Sr., and Katie Loucheim Klopfer to the Portrait Gallery Commission; Frank Moss, Helen Neufeld, Robert Nooter, Frances Humphrey Howard, and David Driskell to the African Art Commission; and Elizabeth Brooke Blake, Thomas C. Howe, Caroline Hume, Nan Tucker McElvoy, Caroline Simmons, and Wilbur L. Ross, Jr., to the American Art Commission.

The January Regents' dinner was held in honor of former Under Secretary Phillip S. Hughes in the Palm Court of the National Museum of American History.

The second meeting of the year was held on May 5, 1986. The Regents formally adopted an amendment to their bylaws providing that a member of the Board shall disclose in writing to the Executive Committee any financial transaction or business dealing with the Institution in which such member has a direct involvement. The Executive Committee reported that on April 9, acting on behalf of the Board, it expressed approval for the appointment of Mr. Barnabas McHenry as a member and chairman of the Investment Policy Committee. Meeting on March 6, the Audit and Review Committee discussed Coopers & Lybrand's audit of the Smithsonian's fiscal year 1985 appropriated and trust funds; recent progress toward identifying a significantly improved personnel/payroll system; a summary of the internal auditors' most significant recommendations in fiscal year 1985; and the administration of the Restoration and Renovation of Buildings program. The Investment Policy Committee recommended, and the Regents approved, an endowment payout rate for fiscal year 1987.

In his Secretary's Report, Mr. Adams gave a brief account of the hearings with the House appropriations subcommittee on the Interior Department and Related Agencies. Discussing possible measures to cope with sharply reduced budgets, including paid admissions and voluntary donations, the Regents agreed that an ad hoc committee of the Regents should be formed to work with the staff to identify and recommend appropriate actions. The Secretary reported on considerable promise since the April 1986 inaugural issue of *Air & Space/Smithsonian* magazine, and he announced that the National Museum of American Art has under development a new scholarly journal to be titled *Smithsonian Studies in American Art*.

After Mr. John Jameson and Miss Ann Leven reported on the status of appropriated and trust funds for fiscal years 1986 and 1987, the Regents agreed that the Secretary should continue to adhere to the principles suggested in the existing policy on the appropriate uses of unrestricted trust funds. In other actions, the Secretary reported on the status of soliciting proposals for food service operations and designing the new restaurant facility for the east terrace of the National Air and Space Museum; the Regents reaffirmed their commitment to the improvement and expansion of facilities of the Cooper-Hewitt Museum and urged continued support for legislation authorizing an appropriation for one-half of the construction costs as soon as practicable; the Board requested that its congressional members introduce and support legislation to repeal Public Law 87-186 which established the National Armed Forces Museum Advisory Board; the Secretary reported on major development initiatives and his decision to close the Smithsonian Environmental Research Center at Rockville, Maryland, effective November 14, 1986; the Regents voted to accept the Annual Report of the Secretary for Fiscal Year 1985; and the Secretary presented status reports on the quadrangle, other major construction, the Museum Support Center storage equipment, litigation, and television and other electronic media.

The Regents' dinner was held in the Renwick Gallery on the preceding evening, May 4, 1986. After dinner Mr. Adams offered some observations on the concept of "crafts" throughout history and gave a brief chronology of the various roles played by the Renwick building and its development as a Smithsonian gallery devoted to the display of crafts as art. Concluding his remarks, the Secretary presented to Renwick Gallery Director Lloyd Herman a piece of sandstone from the original facade of the building.

The Board of Regents held its third meeting of the year on September 15. The Executive Committee reported on its September 3 meeting in which it reiterated the Regents' mandate to replenish the Institution's working capital fund, expressed its appreciation for the care which has been consistently exercised in drawing appropriate distinctions between trust and federal resources in the budget process, and authorized the Secretary to negotiate an agreement for the acquisition of the Folkways Records Collection and Archives. The Audit and Review Committee, having met on June 3, reported that Mr. Adams had announced that, for reasons of security, public parking will soon be accommodated only above ground, and the parking garage of the National

Air and Space Museum will be reserved for the parking of staff and credentialed volunteers and docents, that the committee discussed Coopers & Lybrand's plan of audit for fiscal year 1986 funds, that the committee had reviewed further actions which had been taken in response to the Federal Managers' Financial Integrity Act, and received a presentation on Smithsonian Business Management Activities. The Regents' ad hoc committee on museum admissions, meeting for the first time on June 4, discussed an outline of a comprehensive approach to the study and suggested that the committee and the Regents need to have a clearer demographic profile of visitors from a professional survey and that consideration be given to conducting a short-term experiment of soliciting at the door. The Regents accepted the Investment Policy Committee's recommendations to retain Miller, Anderson and Sherrerd as one of the Institution's investment managers and to appoint Jane Mack Gould to membership on the committee.

In his Secretary's Report, Mr. Adams announced that he will be taking a new, comprehensive approach to the Institution's external relations to achieve a broader view of the Smithsonian's projection of its case for fund-raising and for membership programs, image building, and general publicity. He also discussed the Smithsonian's intention to consummate the sale of the A Street facilities of the Museum of African Art; his concern to assist the Museum of the American Indian in New York; the potential donations of extraordinarily significant collections of modern art and of the art of New Guinea; and Senator Edwin J. Garn's interest in the establishment of a center for the enhancement of space sciences education as a memorial to the *Challenger* astronauts.

Mr. Jameson, after first discussing the Institution's resources for the completion of quadrangle construction and the beginning of quadrangle operations, joined with Miss Leven in a presentation of the financial report. The Regents then approved revisions to current year funding, authorized the Secretary to expend trust and appropriated funds for fiscal year 1987, and approved for submission to the Office of Management and Budget the Institution's budget request for fiscal year 1988. In a related action, the Board authorized the Secretary to negotiate the purchase of a small parcel of land at the Front Royal facility of the National Zoological Park and the sale of other property at the Edgewater facility of the Smithsonian Environmental Research Center.

The Secretary introduced the draft of the *Five-Year Prospectus, FY 1988-FY 1992* and invited the Regents to provide him and the staff with their reactions so that the

document can be reviewed to the Board's satisfaction by its next meeting.

The Regents received a detailed account of the processes followed in soliciting and reviewing competitive bids for all areas of Smithsonian food service operations, and it was noted that the Secretary will soon be selecting the successful bidders. In view of the current low rates of interest, the Board authorized the Secretary to secure a commercial loan for the purpose of financing the costs of constructing and furnishing the terrace restaurant facilities at the National Air and Space Museum.

Mr. Adams noted that, following a lengthy period of negotiation, the staffs of the Institution and the Federal Aviation Administration have agreed on the language of an option of the lease of land at Washington Dulles International Airport on which to expand facilities of the National Air and Space Museum.

After discussing informative reports on major development initiatives, the status of the closure of the Rockville facility of the Smithsonian Environmental Research Center, and the future of the Renwick Gallery and Smithsonian crafts programs, the Regents formally approved a revision to the bylaws of the Commission of the National Portrait Gallery. In addition, having considered the prevailing conditions of visitor parking, the Board concluded that, in view of the Institution's fundamental responsibilities for ensuring the safety of the Smithsonian's visitors and the protection of its staff and national collections, and in view of related financial and administrative burdens of maintaining current levels of public parking, the Secretary should end all public parking on Smithsonian museum lots by October 1.

The Secretary introduced reports on a variety of additional subjects, including the potential effects on the Smithsonian of changes to the Inspectors General Act of 1978, the status of the payroll/personnel system, the quadrangle and other major construction projects, Museum Support Center storage equipment, legislation, litigation, Smithsonian magazines, plans for the bicentennial of the Constitution, the National Science Resources Center, and television.

In recognition of his leadership and great service as Chancellor of the Smithsonian from 1969 until the present, the Regents gave a sustained standing ovation and elected the Honorable Warren E. Burger as Chancellor Emeritus with all the rights, privileges, and responsibilities thereto, upon his retirement.

The traditional Regents' dinner was held in the Regents' honor at the home of Vice President and Mrs. Bush on Sunday, September 14. After Mr. Adams spoke about



the significance of the Board of Regents in the governance of the Smithsonian and expressed his gratitude for the opportunity to work with them, the Vice President announced that the Regents had voted unanimously to award to the Chancellor the Institution's highest honor, the James Smithson Medal, which the Vice President presented with the following citation:

*With warm affection, gratitude and deep respect
The Board of Regents of the Smithsonian Institution
presents the James Smithson Medal to
WARREN E. BURGER
Your wise and principled leadership,
coupled with sensitivity
to the Smithsonian's responsibilities
as well as opportunities,
and deep understanding of its mandate for the
Increase and Diffusion of Knowledge,
have left a shining record of your contributions
as Chancellor of the Institution, 1969–1986.*

The Chancellor thanked the Vice President and the Regents for this special honor, adding that his duties as Chancellor had been the source of great pleasure over the years, and he felt it had been a privilege to be a part of the remarkable growth of the Smithsonian during his tenure.

A unique ivory sculpture attributed to the Vili (Congo), this celebrated work purchased by the National Museum of African Art appears to have been a staff top used by chiefs as an emblem of power. (Photograph by Bruce Fleischer)

Financial Report

Ann R. Leven, Treasurer

The Institution's financial report for fiscal year 1986 portrays a year of contrasts. On the one hand, in the wake of Gramm-Rudman-Hollings, the Institution began a thorough reassessment of its goals and priorities, as well as the costs of achieving them. On the other, given the availability of previously appropriated funds matched by private dollars, construction proceeded at a rapid pace on the quadrangle. Trust funds provided the wherewithal for the Institution to consummate the purchases of the Deletaille Collection for the National Museum of African Art and the Vever Collection for the Arthur M. Sackler Gallery. Both collections will be housed in the quadrangle.

Operations

Federal monies provided the core support for the Institution's continuing programs of research, exhibitions, education, and collections management as well as related administrative and support services. For the fiscal year ending September 30, 1986, the federal government initially provided \$176,995,000 to fund ongoing operations, an increase of \$12.7 million over fiscal year 1985. However, as a result of the Gramm-Rudman-Hollings Act, this amount was subsequently reduced by 4.3 percent (or \$7,611,000) to \$169,384,000. This reduction necessitated hiring freezes, curtailment of equipment purchases for research and collections management, postponement of selected activities, limits on travel and publications, and, sadly for the visiting public, elimination of summer evening hours at Institution museums.

Careful readers of the annual financial statements will see a \$2,316,000 balance in federal funds. The monies in question come from diverse sources and were given this year to the Institution for expenditure over several years: \$1,354,000 equivalent in excess foreign currencies for scientific work primarily in India but also in Pakistan, Burma, and Guinea; \$917,000 from the Department of State for research projects in India; and \$45,000 in reimbursements at the Smithsonian Tropical Research Institute. One hundred eighty-five thousand dollars in uncommitted federal operating monies for salaries and expenses were returned to the Treasury at year end.

The Institution benefited from specific project grants and contracts, totaling \$15,534,000 from government agencies and bureaus. These monies constitute an important source of research funding for the Institution while providing the grantors access to Smithsonian expertise

and resources, particularly in biological studies and astrophysics.

Income from nonappropriated trust funds—including gifts, grants, endowments, current investments, and revenue-producing activities—made the critical difference in fiscal year 1986. The Institution was able to undertake new ventures and strengthen existing outreach programs in a way that might not have been possible otherwise. Recognizing the potential for a financially difficult year, the Regents authorized the Institution's use of additional endowment income for one year only as an exception to established policy, as indicated in the Notes to Financial Statements, below.

The Institution was further blessed with an \$825,000 increase over fiscal year 1985 in restricted gifts and grants from individuals, foundations, and corporations. Increased revenues from the Institution's retail activities and membership programs provided venture capital for the *Air & Space/Smithsonian* magazine while offsetting lost revenue from public parking. In the wake of national concern over terrorism, the Institution closed its major public parking facility under the National Air and Space Museum.

It is useful to compare the Institution's sources of operating funds on a gross and net basis, keeping in mind that expenditures necessary to generate trust revenues, such as those for publishing *Smithsonian* magazine, also contribute to fulfilling James Smithson's mandate to increase and diffuse knowledge.

Source of Funds	Gross Revenues (\$1,000s)	Net Income (\$1,000s)	Net Income %
Federal			
Appropriation	\$169,384	\$169,384	74%
Gov't Gr. and Contracts	15,534	15,534	7
All Trust Sources	<u>174,462</u>	<u>42,891</u>	<u>19</u>
Total Available for Operations	\$359,380	\$227,809	100%

Acquisitions of works of art played an important part in the Institution's fiscal year 1986 financial picture. The Smithsonian funds its collecting activities out of operating funds. As previously noted, the Institution recorded the purchase of the Deletaille Collection and the Vever

Collection. In doing so, the Regents authorized the draw down of approximately \$3,000,000 in the Institution's unrestricted trust fund balance. The fund balance is to be restored to its previous level of \$5,000,000 at the earliest feasible date.

Moreover, in a unique arrangement conceived by the directors of the concerned museums, an important grouping of African objects collected by Joseph Hirshhorn was transferred to the National Museum of African Art. In return, the Institution established an acquisition fund, held in endowment, for the Hirshhorn Museum and Sculpture Garden in honor of its benefactor. Coincidentally, the Hirshhorn Museum undertook a program of deaccessioning that led to the auction of works considered beyond the scope of the museum. Two million dollars in proceeds were added to the newly established Joseph Hirshhorn Acquisition Fund.

Construction and Plant Services

Quadrangle construction was approximately 97 percent complete at the end of fiscal year 1986. Final preparations are under way for the scheduled opening in September 1987. Federal appropriations have funded 50 percent of the project with matching funds provided by private donors.

The principle of joint private and federal partnerships will assure construction of the Earl S. Tupper Research and Conference Center at the Smithsonian Tropical Research Institute. The Smithsonian is deeply grateful to all parties who have made these projects possible.

Additional federal appropriations totaling \$5,281,000 were provided to the National Zoological Park for a health and research facility, the design of the aquatic habitat exhibit, as well as for general repairs and improvements.

Endowment

The Smithsonian's endowment fund was valued at \$181,160,780 on September 30, 1986, topping its previous year-end high on September 5, 1985. The Institution has been equity oriented; this posture served it well as the stock market enjoyed an ebullient period during summer 1986. The endowment has been further enhanced by a transfer of \$3,000,000 from revenues generated by the Institution's auxiliary activities, in keeping with past

practices aimed at strengthening this important Institutional asset.

The role of the Institution's Investment Policy Committee continues to be critical to the success of the endowment. In spring 1986, Regent Barnabas McHenry was designated by the Chancellor as the new chairman of this committee. Regent Carlisle H. Humelsine stepped down as acting chairman. Mrs. Jane Mack Gould, senior vice president of Alliance Capital Management Corporation, joined the committee. Mr. T. Ames Wheeler, former Treasurer of the Institution, resigned from the committee after more than fifteen years of devoted service.

After a thorough analysis of the effectiveness of the investment managers and a review of eighteen prospective managers, a decision was made to replace one of the Institution's managers. The firm of Miller, Anderson and Sherrerd now joins Fiduciary Trust Company of New York, Batterymarch Financial Management, and The Nova Fund as an investment advisor. Advisors are given full discretion as to asset allocation and stock selection within guidelines set by the Investment Policy Committee. The change in managers gave the Smithsonian the opportunity to rebalance the portfolio. Thus, as the financial statements show, at year end 18 percent of the endowment was held in money market accounts as managers redeployed assets.

On the question of South African investments, the Institution maintained its policy of investing only in United States corporations operating in South Africa that have signed the Sullivan Principles, a code of conduct for such corporations. The Smithsonian does not have and never has had any direct investments in South Africa. Holdings in corporations that had not signed the Sullivan Principles were disposed of based on action taken by the Regents in June 1985. In January 1986, the Institution liquidated its position in the Trustees' Commingled Fund—International Equity Portfolio in recognition of the difficulty of monitoring non—United States holdings.

Mindful both of their fiduciary obligations and of the Institution's position in American society, the Regents continue to monitor events in South Africa and developments in United States policy with respect to that nation. The Smithsonian is a member of the South Africa Research Consortium—a loose federation of over forty colleges and universities—which sponsors research of currently available information on South Africa. The Institution is particularly aware of the Reverend Leon Sullivan's proposed May 31, 1987, deadline for South Africa to abolish apartheid.

Financial Management Activities

After a year of reassessment and evaluation, fiscal year 1986 was one of new beginnings in the many areas reporting to the Treasurer. A tireless staff made the year one of significant accomplishments and promise for the future.

Falling under the aegis of the Treasurer is a diverse group of activities: Office of Accounting and Financial Services; Office of Financial Management and Planning; Museum Shops; Mail Order Division; Parking; Concessions; Product Licensing; and Office of Risk Management. With the exception of the Office of Accounting and Financial Services, the orientation is primarily on generating trust funds. The Treasurer maintains a close working relationship with the Assistant Secretary for Administration, the Office of Membership and Development, and the Budget Office.

After more than seventeen years of service to the Institution and nearly twenty-three years of public service, Allen S. Goff retired as assistant treasurer and director of the Office of Accounting and Financial Services. Mr. Goff's leadership during his long tenure is noteworthy. More important, however, was his ability to visualize the Office of Accounting and Financial Services in an era of computerization and updated business practices; this vision began to take shape under his leadership and is his legacy to the Institution.

Shireen L. Dodson, formerly assistant director of the Office of Accounting and Financial Services, was appointed to the new position of Comptroller in August 1986. The office was reorganized and renovated for a more productive utilization of space as well as for accommodation of adequate equipment and furniture necessary for effective operation. New policies and procedures were established for cash disbursement. In addition, implementation of short-term system improvements were initiated. An analysis of the Institution's requirements for a payroll/ personnel system led to the decision to utilize the U.S. Department of Agriculture's service bureau, the National Finance Center.

During the year, the Office of Financial Management and Planning became deeply involved in soliciting a new financial system for the Institution. With the help of outside consultants, progress was made in defining system requirements and assessing the marketplace. A functional task force—including representatives of the Office of Accounting and Financial Services, the Budget Office, the museums, and other bureaus—is assisting in this ongoing

effort. The Office of Risk Management began work on a major Institutional initiative to develop a comprehensive disaster planning program.

Business Activities

It was a banner year for both Mail Order and Museum Shops. In the quest for Smithsonian-related educational products of value and interest to our diverse audiences, success in the marketplace was matched behind the scenes with a flurry of activity to upgrade overloaded computer facilities and outdated warehouse facilities. Product Licensing activities were revitalized, enabling the Institution to benefit from unique Smithsonian-related merchandise created by major American manufacturers. Noteworthy are: Reeves' "First Ladies Dolls" from the National Museum of American History collections and Revell model kits replicating airplanes on view at the National Air and Space Museum.

Perhaps the most monumental task undertaken by the Business Management Office during 1986 was a reassessment of food service activities at the Institution. A long and arduous evaluation was made of potential concessionaires who responded to publicly announced requests for proposals. Over twenty staff members were involved in the process shepherded by the Office of Procurement and Property Management (formerly the Office of Supply Services). Contracts were awarded as the year closed to daka, Inc., to provide public and employee food services at the National Museum of American History, the National Museum of Natural History, and the National Museum of American Art and National Portrait Gallery; to Guest Services, Inc., for similar services for the National Air and Space Museum, the Hirshhorn Museum and Sculpture Garden, and the Smithsonian Institution Building; and to ARA for vending machine service throughout the Institution. The Smithsonian appreciates the cooperation of the Marriott Corporation throughout the transition period.

Coincidental to but separate from the decisions made with respect to concessionaires, the Institution completed plans for a 1,000-seat cafeteria and a 200-seat restaurant in a single ground-level public facility to replace the presently inadequate public cafeteria on the third floor of the National Air and Space Museum. With the Regents' approval, the Institution sought \$11,000,000 in conventional financing for the project, signing for a bank loan with Riggs National Bank in December 1986.

Accounting and Auditing

The Treasurer wishes to express publicly her thanks to the Smithsonian's internal audit staff under Chris S. Peratino [retired in March 1987]. The staff regularly reviews the Institution's financial activities and fiscal systems, assists the outside auditors, and does special projects as required. The audit staff's advice and counsel have been exceptionally helpful during the last two years as the new Treasurer has reviewed almost all aspects of the Institution's fiscal operations.

The Institution's funds, federal and nonappropriated, are audited annually by the independent public accounting firm of Coopers & Lybrand. Coopers & Lybrand's consulting staff also provided assistance to the Institution with respect to food service activities and financial systems and controls at the Cooper-Hewitt Museum.

Additionally, the Defense Contract Audit Agency conducted audits of grants and contracts received from federal agencies, and monitored allocated administrative costs.

The Audit and Review Committee of the Board of Regents, chaired by Regent David Acheson, met three times during the fiscal year pursuant to responsibilities under the bylaws of the Institution. In addition to the review of the 1985 audit performed by Coopers & Lybrand, the

committee gave special attention to the Institution's business activities, safeguards for handling hazardous materials, internal controls, the loss of public parking, and the Institution's building-renovation program.

Coopers & Lybrand's unqualified report for fiscal year 1986 is reprinted on the following pages.

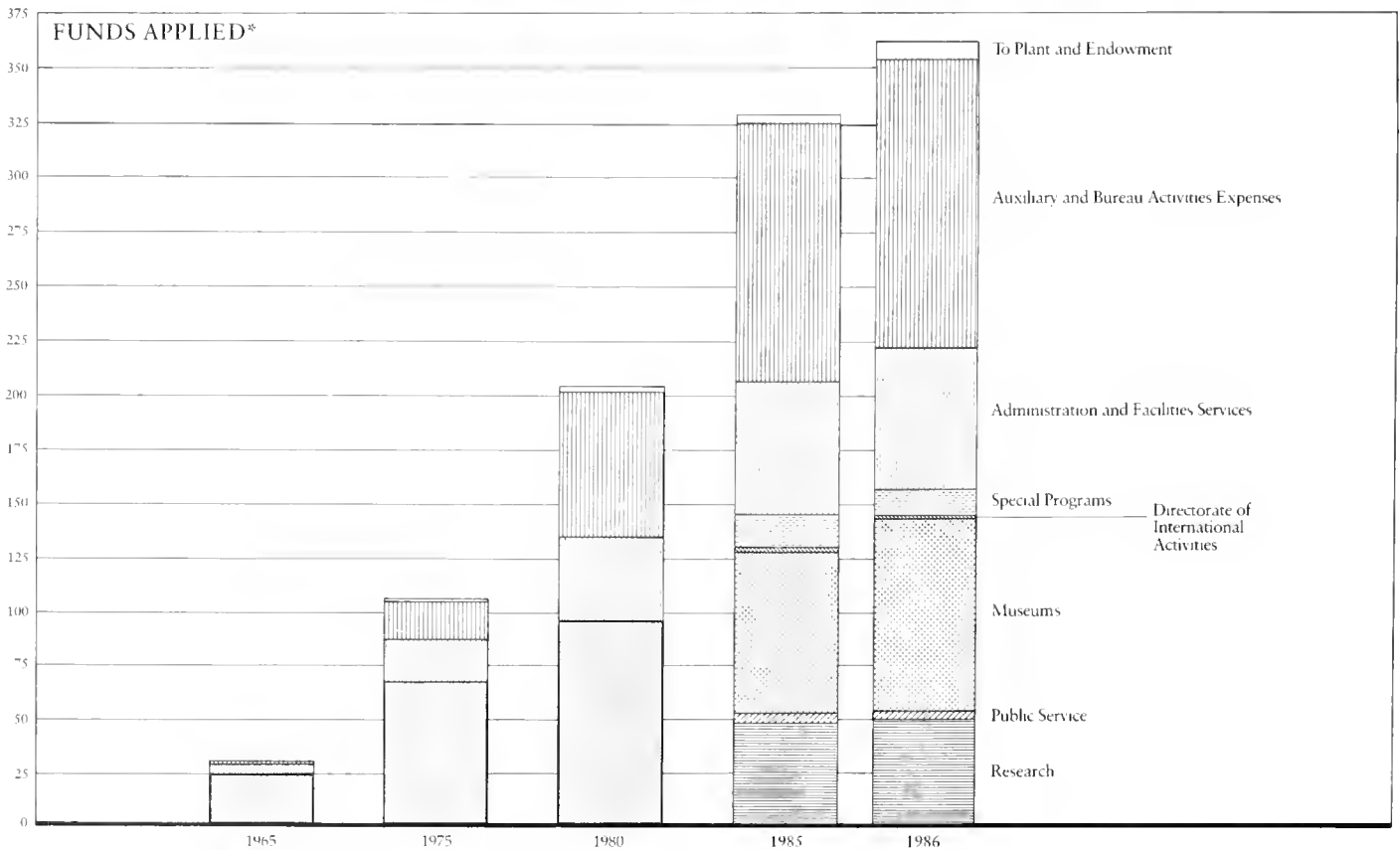
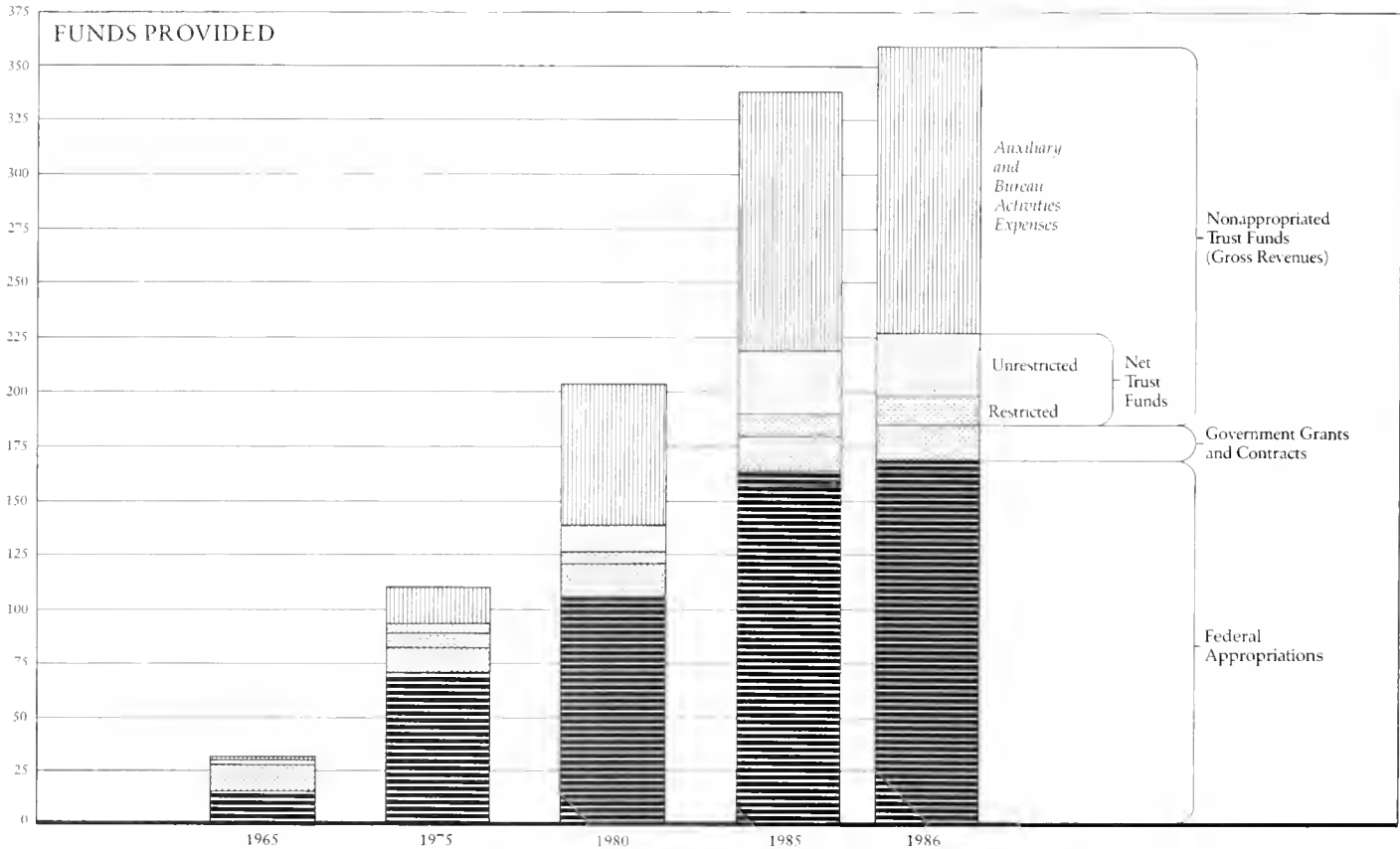
Related Organizations

The Woodrow Wilson International Center for Scholars, the National Gallery of Art, and the John F. Kennedy Center for the Performing Arts were established by Congress within the Institution. Each organization is administered by its own board of trustees and reports independently on its financial status. Fiscal, administrative, and other support services are provided to the Woodrow Wilson International Center for Scholars on a reimbursement basis by the Smithsonian; office space is made available for Wilson Center operations. Administrative services were also provided by the Institution on a contract basis to Reading Is Fundamental and the Visions Foundation. An independent nonprofit operation, the Friends of the National Zoo operates under contract a number of concessions that benefit the National Zoological Park.

Smithsonian Institution Operating Funds

FISCAL YEARS 1965, 1975, 1980, 1985, 1986

(In \$1,000,000's)



*Historical data for certain categories are summarized for 1965, 1975 and 1980.

Table 1 Financial Summary (In \$1,000s)

	FY 1985	FY 1986
INSTITUTIONAL OPERATING FUNDS		
FUNDS PROVIDED:		
Federal Appropriations—Salaries & Expenses	\$164,321	\$169,384
Government Grants & Contracts	15,653	15,534
Nonappropriated Trust Funds:		
For Restricted Purposes	9,937	13,314
For Unrestricted & Special Purposes:		
Auxiliary & Bureau Activities Revenues—Gross	141,160	153,166
Less Related Expenses	(119,361)	(131,571)
Auxiliary & Bureau Activities Net Revenue	21,799	21,595
Investment, Gift & Other Income	6,744	7,982
Total Net Unrestricted & Special Purpose Revenue	28,543	29,577
Total Nonappropriated Trust Funds—Gross	157,841	174,462
—Net	38,480	42,891
Total Operating Funds Provided—Gross	337,815	359,380
—Net	\$218,454	\$227,809
FUNDS APPLIED:		
Research	\$ 51,607	\$ 52,463
Less SAO Overhead Recovery	(2,282)	(2,654)
Museums	76,346	89,765
Public Service	4,480	4,229
Directorate of International Activities	642	1,387
Special Programs	14,654	11,740
Associates & Business Management	930	1,043
Administration—Federal*	11,549	12,726
—Nonappropriated Trust Funds	7,814	8,474
Less Smithsonian Overhead Recovery	(7,391)	(8,491)
Facilities Services	48,576	51,302
Total Operating Funds Applied	206,925	221,984
Transfers (Nonappropriated Trust Funds)		
Unrestricted Funds—To Plant	20	87
—To Endowment	3,014	5,733
Restricted Funds—To Endowment	129	2,314
Total Operating Funds Applied & Transferred Out	\$210,088	\$230,118
CHANGES IN NONAPPROPRIATED TRUST FUND BALANCES:		
Restricted Purpose (Including Government Grants & Contracts)	\$ 587	\$ (28)
Unrestricted—General Purpose	52	(3,094)
—Special Purpose	7,727	813
Total	\$ 8,366	\$ (2,309)
YEAR-END BALANCES—NONAPPROPRIATED TRUST FUNDS:		
Restricted Purpose	\$ 9,684	\$ 9,656
Unrestricted—General Purpose	5,138	2,044
—Special Purpose	23,832	24,645
Total	\$ 38,654	\$ 36,345
OTHER FEDERAL APPROPRIATIONS**		
Special Foreign Currency Program	\$ 8,820	\$ 2,378
Construction	18,326	19,621
Total Federal Appropriation (Including S & E above)	\$191,467	\$191,383

*Includes unobligated funds returned to Treasury: FY 1985—\$173,000; FY 1986—\$185,000.

**Excludes \$1,477,000 received in FY 1986 from the Department of State for research projects in India.

Table 2 Source and Application of Operating Funds for the Year Ended September 30, 1986
 (Excludes Special Foreign Currency Funds, Plant Funds and Endowments) (In \$1,000s)

	Nonfederal Funds						
	Federal Funds	Total Non-federal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Government Grants and Contracts
FUND BALANCES—10/1/85	\$ —	\$ 38,654	\$ 5,138	\$ —	\$ 23,832	\$ 9,312	\$ 372
FUNDS PROVIDED							
Federal Appropriations	\$169,384	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Investment Income	—	9,519	4,617	—	856	4,046	—
Government Grants and Contracts	—	15,534	—	—	—	—	15,534
Gifts	—	10,507	42	3,853	294	6,318	—
Sales and Membership Revenue	—	149,313	—	142,511	6,802	—	—
Other	—	5,123	162	—	2,011	2,950	—
Total Provided	169,384	189,996	4,821	146,364	9,963	13,314	15,534
Total Available	\$169,384	\$228,650	\$ 9,959	\$146,364	\$33,795	\$22,626	\$15,906
FUNDS APPLIED							
<i>Research:</i>							
Assistant Secretary	\$ 653	\$ 1,520	\$ 91	\$ —	\$ 36	\$ 382	\$ 1,011
Astrophysical Observatory	8,642	17,164	2,665	—	1,853	161	12,485
Less Overhead Recovery	—	(2,654)	(2,654)	—	—	—	—
Tropical Research Institute	3,613	932	101	—	364	388	79
Environmental Research Center	3,175	698	75	—	97	43	483
National Zoological Park	11,105	573	113	—	296	157	7
Smithsonian Archives	518	175	173	—	1	1	—
Smithsonian Libraries	4,406	465	331	—	49	85	—
Total Research	32,112	18,873	895	—	2,696	1,217	14,065
<i>Museums:</i>							
Assistant Secretary	496	152	149	—	3	—	—
Museum Programs	366	504	7	—	113	379	5
National Museum of Natural History/Museum of Man	20,212	4,178	110	—	1,343	1,606	1,119
National Air & Space Museum	8,143	2,934	8	—	2,210	369	347
National Museum of American History	11,650	1,918	295	—	831	742	50
National Museum of American Art	4,692	1,295	46	—	273	976	—
National Portrait Gallery	3,517	314	23	—	127	150	14
Hirshhorn Museum	2,961	1,761	13	—	1,253	495	—
Center for Asian Art	2,934	8,578	5,598	—	1,492	1,488	—
Archives of American Art	854	863	22	—	2	839	—
Cooper-Hewitt Museum	932	2,681	773	—	1,434	434	40
National Museum of African Art	2,349	955	54	—	804	97	—
Anacostia Neighborhood Museum	772	50	27	—	23	—	—
National Museum Act	733	—	—	—	—	—	—
Conservation Analytical Laboratory	1,993	35	—	—	33	2	—
Office of Exhibits Central	1,528	(16)	—	—	(16)	—	—
Traveling Exhibition Service	380	3,232	(4)	2,061	340	804	31
Total Museums	64,512	29,434	7,121	2,061	10,265	8,381	1,606

Table 2 Source and Application of Operating Funds for the Year Ended September 30, 1986
(Excludes Special Foreign Currency Funds, Plant Funds and Endowments) (In \$1,000s)

	Nonfederal Funds						
	Federal Funds	Total Non-federal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Government Grants and Contracts
<i>Public Service:</i>							
Assistant Secretary	223	218	190	—	(3)	31	—
Telecommunications	195	694	555	—	139	—	—
Reception Center	187	700	700	—	—	—	—
Office of Public Affairs	558	381	373	—	8	—	—
Smithsonian Press	1,066	13,167	—	13,155	—	—	12
Total Public Service	2,229	15,160	1,818	13,155	144	31	12
Directorate of International Activities	508	879	558	—	33	288	—
<i>Special Programs:</i>							
American Studies & Folklife Program	680	1,318	598	—	98	401	221
International Environmental Science Program	687	—	—	—	—	—	—
Academic & Educational Program	625	2,381	399	—	1,856	126	—
Collections Management Inventory	1,030	—	—	—	—	—	—
Museum Support Center	4,653	110	—	—	110	—	—
JFK Center Grant	333	—	—	—	—	—	—
Total Special Programs	8,008	3,809	997	—	2,064	527	221
Associate Programs	—	77,933	922	76,890	81	40	—
Business Management	—	34,625	—	34,625	—	—	—
Administration	12,541	9,738	7,039	—	2,563	134	2
Less Overhead Recovery	—	(8,491)	(8,491)	—	—	—	—
Facilities Services	49,289	2,211	2,060	—	147	4	—
<i>Transfers Out (In):</i>							
Treasury*	185	—	—	—	—	—	—
Programs**	—	—	5,450	—	(5,450)	—	—
Net Auxiliary Activities	—	—	(18,650)	18,650	—	—	—
Other Designated Purposes	—	—	5,159	983	(6,176)	34	—
Plant	—	87	37	—	50	—	—
Endowment	—	8,047	3,000	—	2,733	2,314	—
Total Transfers	185	8,134	(5,004)	19,633	(8,843)	2,348	—
Total Funds Applied	\$169,384	\$192,305	\$ 7,915	\$146,364	\$ 9,150	\$12,970	\$15,906
FUND BALANCES 9/30/86	\$ —	\$ 36,345	\$ 2,044	\$ —	\$24,645	\$ 9,656	\$ —

*Unobligated funds returned to Treasury.

**Includes Collection Acquisition, Scholarly Studies, Educational Outreach, and Special Exhibitions Programs.

Table 3 Government Grants and Contracts—Expenditures (In \$1,000s)
Fiscal Years 1985 and 1986

Government Agencies	FY 1985	FY 1986
Agency for International Development	\$ 828	\$ 763
Department of Commerce	87	37
Department of Defense	1,245	1,676
Department of Energy	260	509
Department of Health and Human Services	438	461
Department of Interior	196	319
National Aeronautics and Space Administration*	11,425	10,992
National Science Foundation**	895	675
Other	194	474
Total	<u>\$15,568</u>	<u>\$15,906</u>

*Includes \$495,000 (FY 1985) and \$420,000 (FY 1986) in subcontracts from other organizations receiving prime contract funding from NASA.

**Includes \$321,000 (FY 1985) and \$261,000 (FY 1986) in NSF subcontracts from the Chesapeake Research Consortium.

Table 4 Restricted Operating Trust Funds*
Fiscal Years 1985 and 1986 (In \$1,000s)

	Investment	Gifts	Miscellaneous	Total revenue	Deductions	Transfers in (out)	Net increase (decrease)	Fund balance end of year
FY 1985	<u>\$3,639</u>	<u>\$5,493</u>	<u>\$ 805</u>	<u>\$ 9,937</u>	<u>\$ 9,306</u>	<u>\$ (129)</u>	<u>\$502</u>	<u>\$9,312</u>
FY 1986:								
Astrophysical Observatory	\$ 42	\$ 141	\$ —	\$ 183	\$ 161	\$ 27	\$ 49	\$ 11
Tropical Research Institute	69	296	—	365	388	12	(11)	496
National Zoological Park	25	239	3	267	157	—	110	228
Other Research	288	331	—	619	511	(176)	(68)	553
Museum Programs	21	505	10	536	379	—	157	255
National Museum of Natural History	1,354	282	13	1,649	1,606	(303)	(260)	1,269
National Air and Space Museum ...	115	672	2	789	369	—	420	597
National Museum of American History	148	1,473	5	1,626	742	—	884	1,717
National Museum of American Art .	91	463	5	559	976	—	(417)	246
National Portrait Gallery	14	187	—	201	150	—	51	196
Hirshhorn Museum	83	4	1,952	2,039	495	(1,876)	(332)	256
Center for Asian Art	1,389	38	509	1,936	1,488	—	448	1,689
Archives of American Art	37	553	200	790	839	—	(49)	305
Cooper-Hewitt Museum	93	276	33	402	434	(33)	(65)	971
Traveling Exhibition Service	56	102	—	158	804	—	(646)	242
Other Museums	10	138	(1)	147	99	—	48	145
American Studies and Folklife Program	17	285	198	500	401	—	99	127
All Other	194	333	21	548	623	1	(74)	353
Total FY 1986	<u>\$4,046</u>	<u>\$6,318</u>	<u>\$2,950</u>	<u>\$13,314</u>	<u>\$10,622</u>	<u>\$(2,348)</u>	<u>\$344</u>	<u>\$9,656</u>

*Does not include Government Grants and Contracts.

Table 5 Unrestricted Trust Funds—General and Auxiliary Activities
Fiscal Years 1985 and 1986 (In \$1,000s)

	FY 1985	FY 1986
FUNDS PROVIDED		
General Income:		
Investments	\$ 4,137	\$ 4,617
Gifts	37	42
Miscellaneous	233	162
Total General Income	<u>4,407</u>	<u>4,821</u>
Auxiliary Activities Income (Net):		
Associates	13,518	11,284
Business Management:		
—Museum Shops and Mail Order	5,292	6,076
—Concessions and Parking	1,077	1,720
—Other	(228)	(238)
Smithsonian Press	2,176	1,357
Traveling Exhibitions	(311)	(566)
Photo Service*	11	—
Total Auxiliary Activities	<u>21,535</u>	<u>19,633</u>
Total Funds Provided (Net)	<u>25,942</u>	<u>24,454</u>
EXPENDITURES AND TRANSFERS		
Administrative and Program Expense	17,373	24,064
Less Administrative Recovery	<u>9,673</u>	<u>11,145</u>
Net Expense	<u>7,700</u>	<u>12,919</u>
Less Net Transfers Out:		
To Special Purpose for Program Purposes	15,170	11,592
To Plant Funds	20	37
To Endowment Funds	<u>3,000</u>	<u>3,000</u>
Net Transfers Out	<u>18,190</u>	<u>14,629</u>
NET ADDITION TO FUND BALANCE	<u>52</u>	<u>(3,094)</u>
ENDING FUND BALANCE	<u>\$ 5,138</u>	<u>\$ 2,044</u>

*Effective with FY 1986 Photo Services is classified in the Unrestricted Special Purpose Funds.

Table 6 Auxiliary Activities Fiscal Years 1985 and 1986 (In \$1,000s)

Activity	Sales and membership revenue	Gifts	Less cost of sales	Gross revenue	Expenses	Net revenue* (loss)
FY 1985	<u>\$132,218</u>	<u>\$3,150</u>	<u>\$76,593</u>	<u>\$58,775</u>	<u>\$37,240</u>	<u>\$21,535</u>
FY 1986:						
Associates	84,320	3,853	58,686	29,487	18,204	11,283
Business Management:						
—Museum Shops/Mail Order	39,029	—	20,998	18,031	11,956	6,075
—Concessions/Parking	2,660	—	—	2,660	939	1,721
—Other	495	—	—	495	732	(237)
Smithsonian Press	14,513	—	4,328	10,185	8,827	1,358
Traveling Exhibitions	1,494	—	657	837	1,404	(567)
Photo Services (Administration)**	—	—	—	—	—	—
Total FY 1986	<u>\$142,511</u>	<u>\$3,853</u>	<u>\$84,669</u>	<u>\$61,695</u>	<u>\$42,062</u>	<u>\$19,633</u>

*Before revenue-sharing transfers to participating Smithsonian bureaus of \$815,000 (FY 1985) and \$983,000 (FY 1986).

**Effective with FY 1986 Photo Services is classified in the Unrestricted Special Purpose Funds.

Table 7 Unrestricted Special Purpose Funds
Fiscal Years 1985 and 1986 (In \$1,000s)

	Revenue				Transfers in (out)	Deductions			Fund balance end of year
	Investment	Bureau activities	Gifts and other revenue	Total revenue		Program expense	Bureau activity expense	Net increase (decrease)	
FY 1985	<u>\$645</u>	<u>\$5,792</u>	<u>\$1,692</u>	<u>\$8,129</u>	<u>\$15,156</u>	<u>\$10,030</u>	<u>\$5,528</u>	<u>\$7,727</u>	<u>\$23,832</u>
FY 1986:									
Astrophysical Observatory	\$ 13	\$ 358	\$ 62	\$ 433	\$ 982	\$ 830	\$ 496	\$ 89	\$ 1,179
Sao Computer Center	—	520	—	520	130	—	527	123	123
Tropical Research Institute	—	199	—	199	720	210	154	555	657
Environmental Research Center ..	8	16	1	25	119	97	—	47	238
National Zoological Park	292	—	506	798	173	296	—	675	3,746
National Museum of Natural History	26	1	77	104	1,148	1,343	—	(91)	1,185
National Air and Space Museum ..	105	2,820	287	3,212	(148)	948	1,262	854	2,160
National Museum of American History	18	45	134	197	994	814	17	360	1,394
National Museum of American Art	37	8	362	407	493	264	9	627	963
National Portrait Gallery	4	14	51	69	255	116	11	197	319
Hirshhorn Museum	145	—	11	156	(1,840)	1,253	—	(2,937)	559
Center for Asian Art	—	—	—	—	1,496	1,492	—	4	4
Cooper-Hewitt Museum	26	1,068	206	1,300	45	667	767	(89)	662
National Museum of African Art ..	3	1	22	26	704	802	2	(74)	464
Traveling Exhibition Service	3	—	8	11	1,685	340	—	1,356	1,802
Telecommunications	—	67	—	67	42	137	2	(30)	134
SI Computer Center	—	1,169	—	1,169	6	—	1,175	—	—
Fellowships & Grants	32	—	—	32	1,797	1,760	—	69	1,289
Museum Support Center	—	—	—	—	—	110	—	(110)	208
Liability Reserves	—	—	—	—	(133)	(671)	—	538	3,908
Unallocated Programs*	—	—	—	—	(1,165)	—	—	(1,165)	520
All Other	<u>144</u>	<u>516</u>	<u>578</u>	<u>1,238</u>	<u>1,340</u>	<u>2,345</u>	<u>418</u>	<u>(185)</u>	<u>3,131</u>
TOTAL FY 1986	<u>\$856</u>	<u>\$6,802</u>	<u>\$2,305</u>	<u>\$9,963</u>	<u>\$ 8,843</u>	<u>\$13,153</u>	<u>\$4,840</u>	<u>\$ 813</u>	<u>\$24,645</u>

*Includes Collection Acquisition, Scholarly Studies, Educational Outreach, and Special Exhibitions Programs.

Table 8 Special Foreign Currency Program
Fiscal Year 1986—Obligations (In \$1,000s)

Country	Archaeology	Systematic and environmental biology	Astrophysics and earth sciences	Museum programs	Grant Administration	Total
India	\$ —	\$ —	\$—	\$—	\$13	\$ 13
Pakistan	1,134*	108	—	4	60	1,313
Burma	—	25	—	—	—	25
Guinea	30	—	—	—	—	30
Total FY 1986	<u>\$1,164</u>	<u>\$133</u>	<u>\$ —</u>	<u>\$ 4</u>	<u>\$73</u>	<u>\$1,381</u>

*Includes \$1,020 for the preservation of Moenjodaro Project.

Table 9 Construction and Plant Funds
Fiscal Years 1985 and 1986 (In \$1,000s)

	FY 1985	FY 1986
FUNDS PROVIDED		
Federal Appropriations:		
National Zoological Park	\$ 4,851	\$ 5,280
Restoration and Renovation of Buildings	13,475	10,536
Quadrangle	—	3,805
Total Federal Appropriations	<u>18,326</u>	<u>19,621</u>
Nonappropriated Trust Funds:		
Income—Gift and Other		
Smithsonian Environmental Research Center—Gain on Sale	—	161
Smithsonian Tropical Research Institute—Research Facilities	373	767
Erection of Jacksonville Bandstand	3	2
Cooper-Hewitt Museum	2,544	537
American Art and Portrait Gallery Building	20	13
Quadrangle and Related	1,908*	1,125*
Smithsonian Institution Building South Entrance	1	35
Total Income	<u>4,849</u>	<u>2,640</u>
Transfers from Current Funds:		
National Museum of African Art	20	19
East Garden	—	50
Secretaries' Residence	—	18
Total Transfers	<u>20</u>	<u>87</u>
Total Funds Provided	<u>\$23,195</u>	<u>\$22,348</u>

*In the application of Plant Funds for this project, a \$4,000,000 pledge receivable was written off as uncollectible in FY 1985, and \$1,000,000 was refunded in FY 1986 on a previously collected pledge.

Table 10 Endowment and Similar Funds September 30, 1986 (In \$1,000s)

	Book Value	Market Value
ASSETS		
Pooled Consolidated Endowment Funds:		
Cash and Equivalents	\$ 33,495	\$ 33,495
Bonds	13,404	13,955
Convertible Bonds	1,000	980
Stocks	<u>112,727</u>	<u>131,360</u>
Total Pooled Funds	<u>160,626</u>	<u>179,790</u>
Nonpooled Endowment Funds:		
Loan to U.S. Treasury in Perpetuity	1,080	1,080
Notes Receivable	44	44
Bonds	10	10
Land, Net	<u>237</u>	<u>237</u>
Total Nonpooled Funds	<u>1,371</u>	<u>1,371</u>
Total Endowment and Similar Fund Balances	<u>\$161,997</u>	<u>\$181,161</u>
FUND BALANCES		
Unrestricted Purpose: True Endowment	\$ 5,116	\$ 6,313
Quasi Endowment	<u>71,455</u>	<u>76,896</u>
Total Unrestricted Purpose	<u>76,571</u>	<u>83,209</u>
Restricted Purpose: True Endowment	62,267	72,150
Quasi Endowment	<u>23,159</u>	<u>25,802</u>
Total Restricted Purpose	<u>85,426</u>	<u>97,952</u>
Total Endowment and Similar Fund Balances	<u>\$161,997</u>	<u>\$181,161</u>

Table 11 Market Values of Pooled Consolidated Endowment Funds (In \$1,000s)

Fund	9/30/82	9/30/83	9/30/84	9/30/85	9/30/86
Unrestricted	\$35,974	\$ 54,677	\$ 56,592	\$ 65,404	\$ 81,992
Freer	22,596	32,096	31,125	34,066	39,570
Other Restricted	<u>30,288</u>	<u>43,911</u>	<u>43,396</u>	<u>47,830</u>	<u>58,228</u>
Total	<u>\$88,858</u>	<u>\$130,684</u>	<u>\$131,113</u>	<u>\$147,300</u>	<u>\$179,790</u>

Table 12 Changes in Pooled Consolidated Endowment Funds for Fiscal Year 1986 (In \$1,000s)

Fund	Market value 9/30/85	Gifts and transfers	Interest and dividends*	Income paid out	Subtotal	Market value appreciation	Market value 9/30/86
Unrestricted	\$ 65,404	\$5,770	\$2,833	\$2,530	\$ 71,477	\$10,515	\$ 81,992
Freer	34,066	—	1,420	1,262	34,224	5,346	39,570
Other Restricted	<u>47,830</u>	<u>2,736</u>	<u>2,017</u>	<u>1,797</u>	<u>50,786</u>	<u>7,442</u>	<u>58,228</u>
Total	<u>\$147,300</u>	<u>\$8,506</u>	<u>\$6,270</u>	<u>\$5,589</u>	<u>\$156,487</u>	<u>\$23,303</u>	<u>\$179,790</u>

* Income earned, less managers' fees of \$711,722.

Table 13 Endowment Funds September 30, 1986

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
UNRESTRICTED PURPOSE—TRUE:				
Avery Fund*	\$ 171,870	\$ 216,478	\$ 8,730	\$ -0-
Higbee, Harry, Memorial	50,322	63,528	2,027	-0-
Hodgkins Fund*	276,651	298,546	24,647	-0-
Morrow, Dwight W.	303,166	390,791	12,467	-0-
Mussinan, Alfred	94,255	114,284	3,646	-0-
Olmsted, Helen A.	3,163	3,989	127	-0-
Poore, Lucy T. and George W.*	675,476	865,676	31,092	-0-
Porter, Henry Kirke, Memorial	1,120,822	1,443,048	46,034	-0-
Sanford, George H.*	4,829	5,827	329	-0-
Smithson, James*	662,436	662,074	91,702	-0-
Walcott, Charles D. and Mary Vaux, Research (Designated)	1,752,790	2,249,029	71,745	63,624
Subtotal	<u>5,115,780</u>	<u>6,313,270</u>	<u>292,546</u>	<u>63,624</u>
UNRESTRICTED PURPOSE—QUASE:				
Forrest, Robert Lee	4,241,189	4,348,756	138,728	-0-
General Endowment*	58,791,104	63,683,642	1,972,771	-0-
Goddard, Robert H.	33,567	34,439	1,099	-0-
Habel, Dr. S.*	612	611	85	-0-
Hart, Gustavus E.	2,196	2,578	82	-0-
Henry, Caroline	5,433	6,356	203	-0-
Henry, Joseph and Harriet A.	218,369	254,236	8,110	-0-
Heys, Maude C.	407,690	423,157	13,499	-0-
Hinton, Carrie Susan	110,694	123,787	3,949	-0-
Lambert, Paula C.	199,870	227,104	7,245	-0-
Medinus, Grace L.	4,039	4,212	134	-0-
Rhees, William Jones*	2,835	3,186	178	-0-
Safford, Clara Louise	186,787	197,653	6,305	-0-
Smithsonian Bequest Fund*	1,064,824	1,095,595	26,175	-0-
Taggart, Ganson	1,892	2,408	77	-0-
Abbott, William L. (Designated)	511,653	597,591	19,063	54,536
Barstow, Frederic D. (Designated)	4,283	4,995	159	6,250
Hirshhorn Museum Acquisition Fund (Designated)	2,764,147	2,904,378	92,651	97,303
Lindbergh Chair of Aerospace History (Designated)	1,942,809	2,069,720	66,025	80,346
Lindbergh, Charles A. (Designated)	17,836	20,157	1,592	10,882
Lyon, Marcus Ward, Jr. (Designated)	16,803	17,807	568	3,516
Webb, James E., Fellowship (Designated)	926,005	873,049	27,851	49,558
Subtotal	<u>71,454,637</u>	<u>76,895,417</u>	<u>2,386,549</u>	<u>302,391</u>
Total Unrestricted Purpose	<u>\$ 76,570,417</u>	<u>\$ 83,208,687</u>	<u>\$ 2,679,095</u>	<u>\$ 366,015</u>

Table 13 Endowment Funds September 30, 1986 (Continued)

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
RESTRICTED PURPOSE—TRUE:				
Arthur, James	\$ 150,708	\$ 195,735	\$ 6,244	\$ 6,034
Baird, Spencer Fullerton	136,216	174,966	5,582	4,356
Barney, Alice Pike, Memorial	108,034	140,265	4,475	25,005
Batchelor, Emma E.	132,805	145,088	4,628	82,743
Beauregard, Catherine, Memorial	167,973	196,007	6,253	63,869
Bergen, Charlotte V.	14,327	14,486	462	1,179
Brown, Roland W.	113,504	134,522	4,291	17,895
Canfield, Frederick A.	156,512	215,655	6,880	124
Casey, Thomas Lincoln	53,811	62,840	2,005	6,154
Chamberlain, Frances Lea	106,074	137,722	4,393	22,642
Cooper Fund for Paleobiology	114,179	118,221	3,700	-0-
Division of Mammals Curators Fund	7,758	8,765	279	5,095
Drake Foundation	698,669	776,927	24,678	118,964
Drouet, Francis and Louderback, Harold B. Fund	229,937	233,890	7,461	21,627
Dykes, Charles, Bequest	208,250	238,139	7,522	12,075
Eickemeyer, Florence Brevoort	40,935	53,139	1,695	17,454
Forbes, Edward Waldo	431,896	419,689	10,041	10,411
Freer, Charles L.	33,951,121	39,570,119	1,262,308	1,285,590
Grimm, Sergei N.	120,701	123,976	3,955	21,891
Groom, Barrick W.	123,599	124,798	3,981	8,966
Guggenheim, Daniel and Florence	473,747	506,305	16,151	42,397
Hamilton, James*	4,639	5,174	491	2,018
Henderson, Edward P., Meteorite Fund	1,415	1,741	56	593
Hewitt, Eleanor G., Repair Fund	28,678	31,832	1,016	1,999
Hewitt, Sarah Cooper	169,519	187,893	5,994	12,503
Hillyer, Virgil	28,217	32,954	1,051	12,417
Hitchcock, Albert S.	5,998	7,841	250	251
Hodgkins Fund*	122,273	122,212	16,936	6,668
Hrdlicka, Ales and Marie	205,599	243,682	7,774	8,152
Hughes, Bruce	72,147	93,722	2,990	19,083
Johnson, Seward, Trust Fund for Oceanography	14,060,254	16,457,798	525,013	133,119
Kellogg, Remington, Memorial	96,864	101,504	3,238	10,157
Kramar, Nada	11,245	12,811	409	4,247
Lindsey, Jessie H.*	12,840	13,575	1,181	11,413
Maxwell, Mary E.	73,926	96,026	3,063	34,545
Milliken, H. Oothout, Memorial	845	936	30	81
Mineral Endowment	384,923	431,256	13,757	(15)
Mitchell, William A.	52,478	58,995	1,882	2,513
Nelson, Edward William	86,321	108,742	3,469	104
Petrocelli, Joseph, Memorial	27,997	36,424	1,162	29,030
Reid, Addison T.*	89,780	102,560	4,706	10,226
Ripley, S. Dillon and Mary Livingston	108,225	116,586	3,612	-0-
Roebling Fund	453,535	587,416	18,739	360
Rollins, Miriam and William	891,426	1,068,010	33,780	8,770
Sims, George W.	89,709	89,805	2,863	6,377
Sprague Fund	5,754,715	6,386,341	201,990	38,070
Springer, Frank	67,805	87,656	2,796	23,630
Stern, Harold P., Memorial	680,365	752,244	23,997	95,382
Stevenson, John A., Mycological Library	20,599	23,948	764	2,229
Stuart, Mary Horner, Mineral Fund	313,123	304,273	7,280	7,514
Walcott, Charles D. and Mary Vaux, Research	575,569	677,470	21,385	8,700
Walcott Research Fund, Botanical Publications	216,852	296,483	9,458	5,315
Williston, Samuel Wendell Diptera Research	15,189	16,058	492	2,299
Zerbee, Frances Brinckle	3,562	4,609	147	5,781
Subtotal	62,267,388	72,149,831	2,308,755	2,278,002

Table 13 Endowment Funds September 30, 1986 (Continued)

	Principal		Income	
	Book value	Market value	Net income	Unexpended balance
RESTRICTED PURPOSE—QUASI:				
Armstrong, Edwin James	13,630	14,885	467	-0-
Au Panier Fleuri	78,885	81,109	2,587	4,903
Bacon, Virginia Purdy	368,323	407,089	12,986	37,964
Becker, George F.	635,168	704,596	22,477	76
Desautels, Paul E.	50,048	57,394	1,800	-0-
Gaver, Gordon	5,022	5,730	183	3,393
Hachenberg, George P. and Caroline	17,856	21,417	683	2,884
Hanson, Martin Gustav and Caroline R.	38,153	44,544	1,421	8,938
Hirshhorn Collections Endowment Fund	1,899,784	1,776,223	4,722	4,755
Hunterdon Endowment	12,700,618	14,636,762	466,921	202,444
ICBP Endowment	760,166	796,881	25,143	136
ICBP Conservation Endowment	169,736	175,425	5,580	13,049
Johnson, E. R. Fenimore	31,225	32,981	1,052	5,434
Loeb, Morris	376,728	441,780	14,093	47,683
Long, Annette E. and Edith C.	2,078	2,729	87	465
Myer, Catherine Walden	86,717	101,250	3,230	20,700
Noyes, Frank B.	4,276	5,103	163	3,094
Noyes, Pauline Riggs	37,153	38,220	1,219	2,536
Pell, Cornelia Livingston	31,937	37,378	1,192	4,265
Ramsey, Adm. and Mrs. Dewitt Clinton*	1,194,686	1,273,649	41,201	12,686
Rathbun, Richard, Memorial	45,786	53,557	1,708	18,104
Roebing Solar Research	102,060	115,148	3,673	13,304
Ruef, Bertha M.	121,731	128,527	4,100	4,543
Schultz, Leonard P.	38,780	44,142	1,348	33,177
Seidell, Atherton	2,517,522	2,783,729	88,803	322,591
Smithsonian Agency Account	1,234,738	1,325,941	43,010	913
Strong, Julia D.	43,030	50,326	1,605	4,123
Witherspoon, Thomas A., Memorial	553,371	645,746	20,600	52,998
Subtotal	<u>23,159,207</u>	<u>25,802,261</u>	<u>772,054</u>	<u>825,158</u>
Total Restricted Purpose	<u>\$ 85,426,595</u>	<u>\$ 97,952,092</u>	<u>\$3,080,809</u>	<u>\$3,103,160</u>
TOTAL ENDOWMENT FUNDS	<u>\$161,997,012</u>	<u>\$181,160,780</u>	<u>\$5,759,904**</u>	<u>\$3,469,175</u>

* Invested all or in part in U.S. Treasury or other nonpooled investments.

** Total Return Income Payout; does not include \$265,089 of interest income for investment of unexpended income balances.

Coopers & Lybrand
Certified Public Accountants

To the Board of Regents
Smithsonian Institution

We have examined the statement of financial condition of the Smithsonian Institution as of September 30, 1986, and the related statement of financial activity for the year then ended. Our examination was made in accordance with generally accepted auditing standards and with generally accepted governmental auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the financial statements of the Smithsonian Institution for the year ended September 30, 1985, totals of which are included in the accompanying financial statements for comparative purposes only.

In our opinion, the financial statements referred to above, present fairly the financial position of the Smithsonian Institution as of September 30, 1986, and the results of its operations and changes in its fund balances for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Coopers & Lybrand

1800 M Street, N.W.
Washington, D.C. 20036
December 23, 1986

Smithsonian Institution Statement of Financial Condition
September 30, 1986 (with comparative totals for September 30, 1985)
(thousands of dollars)

	Trust funds	Federal funds	Total all funds	Totals 1985
ASSETS:				
Fund balances with U.S. Treasury and cash on hand	\$ 744	\$ 78,689	\$ 79,433	\$ 75,365
Investments (Notes 1 and 3)	220,190	—	220,190	192,602
Receivables (Note 5)	35,953	8,016	43,969	48,301
Advance payments (Note 6)	431	15,174	15,605	16,567
Merchandise inventory (Note 1)	11,140	—	11,140	11,340
Materials and supplies inventory (Note 1)	—	1,421	1,421	1,340
Prepaid, deferred expense and other (Note 1)	13,952	—	13,952	13,400
Property and equipment (Notes 1 and 7)	45,418	212,679	258,097	235,689
Total assets	<u>\$327,828</u>	<u>\$315,979</u>	<u>\$643,807</u>	<u>\$594,604</u>
LIABILITIES:				
Accounts payable and accrued expenses, including interfund payable of \$17,609,000	39,443	16,444	55,887	50,307
Deposits held in custody for other organizations (Note 2)	4,071	28	4,099	3,937
Accrued annual leave (Note 1)	1,966	7,770	9,736	9,322
Deferred revenue (Note 1)	30,999	—	30,999	28,133
Total liabilities	<u>76,479</u>	<u>24,242</u>	<u>100,721</u>	<u>91,699</u>
Undelivered orders (Note 1)	—	59,368	59,368	57,425
FUND BALANCES (Note 1):				
Trust Funds:				
Current:				
Unrestricted general purpose	2,044	—	2,044	5,138
Special purpose	24,645	—	24,645	23,832
Restricted	9,656	—	9,656	9,684
Endowment and similar funds (Note 4)	161,997	—	161,997	137,444
Plant funds (Note 7)	53,007	—	53,007	51,160
Total trust fund balances	<u>251,349</u>	<u>—</u>	<u>251,349</u>	<u>227,258</u>
Federal Funds:				
Operating funds—restricted (Note 8)	—	2,316	2,316	177
Construction funds	—	15,952	15,952	15,349
Capital funds	—	214,101	214,101	202,696
Total federal fund balances	<u>—</u>	<u>232,369</u>	<u>232,369</u>	<u>218,222</u>
Total fund balances	<u>251,349</u>	<u>232,369</u>	<u>483,718</u>	<u>445,480</u>
Total liabilities, undelivered orders and fund balances	<u>\$327,828</u>	<u>\$315,979</u>	<u>\$643,807</u>	<u>\$594,604</u>

The accompanying notes are an integral part of the financial statements.

Smithsonian Institution Statement of Financial Activity for the year ended September 30, 1986
(with comparative totals for the year ended September 30, 1985) (thousands of dollars)

	Trust funds				Totals, federal funds
	Totals, trust funds	Current funds	Endowment and similar funds	Plant funds	
REVENUE AND OTHER ADDITIONS:					
Appropriations	\$ —	\$ —	\$ —	\$ —	\$191,383
Auxiliary activities revenue	149,313	149,313	—	—	—
Government grants and contracts	15,534	15,534	—	—	—
Investment income	11,988	10,307	—	1,681	—
Net gain on sale of securities and property	15,478	—	15,282	196	—
Gifts, bequests, and foundation grants	11,707	10,507	436	764	—
Additions to plant	11,562	—	—	11,562	28,976
Rentals, fees, commissions, and other	5,854	5,854	—	—	1,627
Total revenue and other additions	221,436	191,515	15,718	14,203	221,986
EXPENDITURES AND OTHER DEDUCTIONS:					
Research, educational, and collection acquisition expenditures (Note 9)	45,305	45,305	—	—	109,162
Administrative expenditures	12,005	12,005	—	—	12,614
Facilities services expenditures	2,211	2,211	—	—	49,289
Auxiliary activities expenditures	125,381	125,381	—	—	—
Acquisition of plant and other	11,447	—	—	11,447	19,018
Property use and retirements (Note 7)	829	—	—	829	17,571
Retirement of and interest on indebtedness	167	—	—	167	—
Total expenditures and other deductions	197,345	184,902	—	12,443	207,654
Excess of revenue and other additions over expenditures and other deductions	24,091	6,613	15,718	1,760	14,332
TRANSFERS AMONG FUNDS— ADDITIONS (DEDUCTIONS) (Note 10)					
	—	(8,922)	8,835	87	—
Net increase for the year	24,091	(2,309)	24,553	1,847	14,332
Returned to U.S. Treasury	—	—	—	—	(185)
Fund balances at beginning of year	227,258	38,654	137,444	51,160	218,222
Fund balances at end of year (Note 8)	\$251,349	\$ 36,345	\$161,997	\$53,007	\$232,369

The accompanying notes are an integral part of the financial statements.

Federal funds			Totals, all funds	Totals, 1985
Operating funds	Construction funds	Capital funds		
\$171,762	\$19,621	\$ —	\$191,383	\$191,467
—	—	—	149,313	138,010
—	—	—	15,534	15,652
—	—	—	11,988	12,658
—	—	—	15,478	15,745
—	—	—	11,707	9,742
—	—	28,976	40,538	43,064
<u>1,627</u>	<u>—</u>	<u>—</u>	<u>7,481</u>	<u>3,419</u>
173,389	19,621	28,976	443,422	429,757
109,162	—	—	154,467	149,677
12,614	—	—	24,619	23,104
49,289	—	—	51,500	48,615
—	—	—	125,381	114,270
—	19,018	—	30,465	25,971
—	—	17,571	18,400	17,155
<u>—</u>	<u>—</u>	<u>—</u>	<u>167</u>	<u>20</u>
<u>171,065</u>	<u>19,018</u>	<u>17,571</u>	<u>404,999</u>	<u>378,812</u>
<u>2,324</u>	<u>603</u>	<u>11,405</u>	<u>38,423</u>	<u>50,945</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
2,324	603	11,405	38,423	50,945
(185)	—	—	(185)	(173)
<u>177</u>	<u>15,349</u>	<u>202,696</u>	<u>445,480</u>	<u>394,708</u>
<u>\$ 2,316</u>	<u>\$15,952</u>	<u>\$214,101</u>	<u>\$483,718</u>	<u>\$445,480</u>

Smithsonian Institution Notes to Financial Statements

I. Summary of Significant Accounting Policies

Basis of Presentation

These financial statements do not include the accounts of the National Gallery of Art, the John F. Kennedy Center for the Performing Arts or the Woodrow Wilson International Center for Scholars, which were established by Congress within the Smithsonian Institution (the Institution) but are administered under separate boards of trustees.

The financial statements of the Institution have been combined for this presentation to show both federal appropriations and trust funds. So-called federal funds reflect the receipt and expenditures of monies obtained from congressional appropriations. The accounts of the federal funds have been prepared on the obligation basis of accounting, which is in accordance with accounting principles prescribed by the Comptroller General of the United States as set forth in the *Policy and Procedures Manual for Guidance of Federal Agencies*. The obligation basis of accounting differs in some respects from generally accepted accounting principles. Under this method of accounting, approximately \$44,198,000 of commitments of the operating fund, such as purchase orders and contracts, have been recognized as expenditures, and the related obligations have been reported on the balance sheet at September 30, 1986 even though the goods and services have not been received as of the balance sheet date. Approximately \$15,454,000 of these commitments are for internal storage facilities and equipment at the Museum Support Center. In addition, construction fund commitments for other projects, principally the Quadrangle, amounted to approximately \$15,171,000 at September 30, 1986.

The trust funds reflect the receipt and expenditure of funds obtained from private sources, federal grants and contracts, investment income and certain business activities related to the operations of the Institution. The financial statements with respect to trust funds have been prepared on the accrual basis.

Fund Accounting

To ensure observance of the limitations and restrictions placed on the use of resources available to the Institution, accounts are maintained in accordance with the principles of fund accounting. This procedure classifies resources for control, accounting and reporting purposes into distinct funds established according to their appropriation, nature

and purposes. 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.

The assets, liabilities and fund balances of the Institution are self-balancing as follows:

Federal operating funds represent the portion of expendable funds available for support of Institution operations.

Federal construction funds represent that portion of expendable funds available for building and facility construction, restoration, renovation and repair. Separate subfund groups are maintained for each appropriation—Construction and Improvements, National Zoological Park, Restoration and Renovation of Buildings, Museum Support Center and the Center for African, Near Eastern, and Asian Cultures (Quadrangle).

Federal capital funds represent the value of those assets of the Institution acquired with federal funds plus nonexpendable property transfers from government agencies.

Trust current funds, which include unrestricted and restricted resources, represent the portion of expendable funds that is available for support of Institution operations. Amounts restricted by the donor for specific purposes are segregated from other current funds.

Trust endowment and similar funds include funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and the income only be used. Also classified as endowment and similar funds are gifts which allow the expenditure of principal but only under certain specified conditions. Quasi-endowment funds are funds established by the governing board for the same purposes as endowment funds; however, any portion of such funds may be expended. Restricted quasi-endowment funds represent gifts for restricted purposes where there is no stipulation that the principal be maintained in perpetuity or for a period of time, but the governing board has elected to invest the principal and expend only the income for the purpose stipulated by the donor.

Trust plant funds represent resources restricted for future plant acquisitions and funds expended for plant.

Investments

All gains and losses arising from the sale, collection or other disposition of investments and property are

accounted for in the fund in which the related assets are recorded. Income from investments is accounted for in a similar manner, except for income derived from investments of endowment and similar funds, which is accounted for in the fund to which it is restricted or, if unrestricted, as revenue in unrestricted current funds. Gains and losses on the sale of investments are recognized on the settlement date basis using the specific identification method, whereby the cost of the specific security adjusted by any related discount or premium amortization is the basis for recognition of the gain or loss.

Inventory

Inventories are carried at the lower of cost or market. Cost is determined using the first-in, first-out (FIFO) method, retail cost method (for those inventories held for resale) or net realizable value.

Deferred Revenue and Expense

Revenue from subscriptions to *Smithsonian* magazine is recorded as income over the period of the related subscription, which is one year. Costs related to obtaining subscriptions to *Smithsonian* magazine are charged against income over the period of the subscription.

The Institution recognizes revenue and charges expenses of other auxiliary activities during the period in which the activity is conducted.

Works of Art, Living or Other Specimens

The Institution acquires its collections, which include works of art, library books, photographic archives, objects and specimens, through purchase with federal or private funds or by donation. In accordance with policies generally followed by museums, no value is assigned to the collections on the statement of financial condition. Purchases for the collections are expensed currently.

Property and Equipment

Nonexpendable equipment purchased with federal funds is recorded at cost and is depreciated on a straight-line basis over a period of 10 years. Equipment purchased with trust funds for use by nonincome-producing activities is treated as a deduction of the current fund and a capitalized cost of the plant fund. Depreciation on equipment capitalized in the plant fund is recorded on a straight-line basis over the

estimated useful life of 3 to 10 years (see Note 7). Capital improvements and equipment purchased with trust funds and utilized in income-producing activities are capitalized in the current unrestricted fund at cost and are depreciated on a straight-line basis over their estimated useful lives of 3 to 10 years.

Buildings and other structures, additions to buildings and fixed equipment purchased with federal funds are recorded in the capital funds at cost and depreciated on a straight-line basis over a period of 30 years. Costs associated with renovating, restoring and improving structures are depreciated over their useful lives of 15 years.

Certain lands occupied by the Institution's buildings were appropriated and reserved by Congress for the Smithsonian and are not reflected in the accompanying financial statements. Property and nonexpendable equipment acquired through transfer from government agencies are capitalized at the transfer price or at estimated amounts, taking into consideration usefulness, condition and market value.

Real estate (land and buildings) purchased with trust funds is recorded at cost, to the extent that restricted or unrestricted funds were expended therefor, or appraised value at date of gift, except for gifts of certain islands in the Chesapeake Bay and the Carnegie Mansion, which have been recorded at nominal values. Costs of original building structures and major additions are depreciated on a straight-line basis over their estimated useful lives of 30 years. Costs of renovating, restoring and improving structures are depreciated on a straight-line basis over their estimated useful lives of 15 years. Depreciation is recorded in the plant funds as a deduction to the investment in plant (see Note 7).

Government Grants and Contracts

The Institution has a number of grants and contracts with the U.S. Government, which primarily provide for cost reimbursement to the Institution. Grant and contract revenue is recognized as expenditures are incurred within trust funds.

Pledges

The Institution records significant pledges that are supported by letters signed by donors. Pledges are recorded at net realizable value as a receivable and as deferred revenue on the Statement of Financial Condition. Revenue from pledges is recognized in the year the pledge funds are collected.

Contributed Services

A substantial number of unpaid volunteers have made significant contributions of their time in the furtherance of the Institution's programs. The value of this contributed time is not reflected in these statements in accordance with generally accepted accounting principles.

Annual Leave

The Institution's civil service employees earn annual leave in accordance with federal law and regulations. However, only the cost of leave taken as salaries is funded and recorded as an expense. The cost of unused annual leave at year-end is reflected in the accompanying financial statements as an asset and accrued liability of the federal funds capital account.

Annual leave is recorded for trust employees in the trust fund as earned.

2. Related Activities

The Institution provides fiscal and administrative services to several separately incorporated organizations in which certain officials of the Institution serve on the governing boards. The amounts paid to the Institution by these organizations for the aforementioned services, together with rent for Institution facilities occupied, totaled approximately \$367,000 (\$295,000 for the trust funds and \$72,000 for the federal funds) for the year ended September 30, 1986. Deposits held in custody for these organizations were approximately \$4,071,000 as of September 30, 1986.

The following summarizes the approximate expenditures of these organizations for the fiscal year ended September 30, 1986 as reflected in their individual financial statements, which are not included in the accompanying financial statements of the Institution:

Visions Foundation, Inc.	\$1,452,000
Reading Is Fundamental, Inc.	\$6,780,000
Woodrow Wilson International Center for Scholars:	
Trust funds	\$5,121,000
Federal appropriations	\$3,197,000

3. Investments

Investments are recorded at cost on a settlement date basis, if purchased, or estimated fair market value at date of acquisition, if acquired by gift. At September 30, 1986, investments were composed of the following:

	Carrying value (S000s)	Market value (S000s)
Current funds:		
Certificates of deposit and repurchase agreement	\$ 16,816	\$ 16,816
Commercial paper	1,980	2,000
U.S. Government and quasi- government obligations	39,844	41,449
Corporate bonds	75	75
Common stock	13	6
Preferred stock	97	93
	<u>58,825</u>	<u>60,439</u>
Endowment and similar funds:		
Money market account	32,992	32,992
Deposit with U.S. Treasury	1,080	1,080
U.S. Government and quasi- government obligations	13,335	13,886
Corporate bonds	1,079	1,059
Common stock	110,967	129,845
Preferred stock	1,760	1,515
	<u>161,213</u>	<u>180,377</u>
Plant funds:		
U.S. Government and quasi- government obligations	27	29
Common stock	125	125
	<u>152</u>	<u>154</u>
	<u>\$220,190</u>	<u>\$240,970</u>

Since October 1, 1982, the deposit with the U.S. Treasury has been invested in U.S. Government securities at a variable yield based on market rates.

Substantially all the investments of the endowment and similar funds are pooled on a market value basis (consolidated fund) with each individual fund subscribing to or disposing of units on the basis of the per unit market value at the beginning of the month within which the transaction takes place. The unit value as of September 30, 1986 was

\$259.24; 299,239 units were owned by endowment, and 394,280 units were owned by quasi-endowment at September 30, 1986.

The following tabulation summarizes changes in relationships between cost and market values of the pooled investments (excludes nonpooled investments such as the deposit with the U.S. Treasury, land held for investment and receivables of the endowment fund):

	(\$000s)			Market value per unit
	Market	Cost	Difference	
End of year	\$179,790	\$160,626	\$19,164	\$259.24
Beginning of year	\$147,300	\$136,156	11,144	223.18
Increase in unrealized net gain for the year			8,020	—
Realized net gain for the year			15,282	—
Net change			<u>\$23,302</u>	<u>\$ 36.06</u>

4. Endowment and Similar Funds

The fund balances for the endowment and similar funds at September 30, 1986 are summarized as follows:

	(\$000s)
Endowment funds, income available for:	
Restricted purposes	\$ 62,267
Unrestricted purposes	5,116
	<u>67,383</u>
Quasi-endowment funds, principal and income available for:	
Restricted purposes	23,159
Unrestricted purposes	71,455
	<u>94,614</u>
Total endowment and similar funds	<u>\$161,997</u>

The Institution utilizes the "total return" approach to investment management of endowment funds and quasi-endowment funds. Under this approach, the total invest-

ment return is considered to include realized and unrealized gains and losses in addition to interest and dividends. An amount of principal equal to the difference between interest and dividends earned during the year and the amount computed under the total return formula is transferred to or from the current funds.

In applying this approach, it is the Institution's policy to provide, as being available for current expenditures, an amount taking into consideration such factors as, but not limited to: (1) 4¹/₂% of the five-year average of the market value of each fund (adjusted for gifts and transfers during this period), unless a higher percentage is approved by the Regents, (2) current dividend and interest yield, (3) support needs for bureaus and scientists, and (4) inflationary factors as measured by the Consumer Price Index; however, where the market value of the assets of any endowment fund is less than 110% of the historic dollar value (value of gifts at date of donation), the amount provided is limited to only interest and dividends received.

The total return factor for 1986 was 5% or \$8.27 per unit to all participating funds. The total return applied for 1986 was \$3,060,000 to Restricted Funds and \$2,529,000 to Unrestricted Funds.

5. Receivables

Receivables at September 30, 1986 included the following:

	(\$000s)
<i>Federal funds</i>	
Amount to be provided for accrued annual leave	\$ 7,770
Service fees and charges	246
	<u>8,016</u>
<i>Trust funds</i>	
Accounts receivable, auxiliary activities, net	12,480
Interfund receivables due from current funds:	
Endowment and similar funds	500
Plant funds	17,109
Interest and dividends receivable	1,926
Unbilled costs and fees from grants and contracts	2,527
Pledges	1,365
Other	46
	<u>35,953</u>
Total, all funds	<u>\$43,969</u>

6. Advance Payments

Advance payments represent prepayments made to government agencies, educational institutions, firms and individuals for services to be rendered or property or materials to be furnished.

As of September 30, 1986, the Institution had advances outstanding to the U.S. Government of approximately \$12,528,000, principally for construction services to be completed in future fiscal years. The Institution at that date also had advances outstanding to educational institutions amounting to approximately \$1,959,000, principally under the Special Foreign Currency Program.

7. Property and Equipment

At September 30, 1986, property and equipment were comprised of the following:

	<u>(\$000s)</u>	<u>(\$000s)</u>
<i>Federal</i>		
<i>Capital funds</i>		
Property	\$308,960	
Equipment	34,260	
Less accumulated depreciation	<u>(130,541)</u>	
Total, federal funds		<u>\$212,679</u>
<i>Trust</i>		
<i>Current funds</i>		
Capital improvements	\$ 5,202	
Equipment	8,096	
Leasehold improvements	893	
Less accumulated depreciation and amortization	<u>(7,265)</u>	
	<u>6,926</u>	
<i>Endowment and similar funds</i>		
Land	<u>239</u>	
<i>Plant funds</i>		
Land and buildings	\$ 41,962	
Equipment	3,983	
Less accumulated depreciation	<u>(7,692)</u>	
	<u>38,253</u>	
Total, trust funds		<u>45,418</u>
Total, all funds		<u>\$258,097</u>

Included in the accumulated depreciation of the federal capital funds is approximately \$13,988,000 of the depreciation expense for 1986.

Trust funds' depreciation and amortization expense for fiscal year 1986 for income-producing assets amounted to approximately \$1,925,000, which is included in auxiliary activities expenditures in the current funds. Depreciation of non-income-producing equipment and buildings for 1986 amounted to approximately \$829,000.

The balance of the plant fund at September 30, 1986, included approximately \$14,754,000 of trust unexpended plant funds.

8. Federal Operating Funds

The federal operating funds include appropriations for salaries and expenses which are expended in the year received. Also included are amounts received with the provision that such amounts can be expended over a period greater than one year.

The federal operating funds for the year ended September 30, 1986, include the following:

	<u>Additions (\$000s)</u>		Fund Balance at Sept. 30, 1986
	<u>Appropriations</u>	<u>Other</u>	
Salaries and Expenses	\$169,384	\$ —	\$ —
Special Foreign Currency Program	2,378	—	1,354
U.S. India Fund (transfers from Department of State)	—	1,477	917
Smithsonian Tropical Research Institute	—	150	45
	<u>\$171,762</u>	<u>\$1,627</u>	<u>\$2,316</u>

9. Collection Acquisitions

In keeping with accounting principles, the Institution records the acquisition of collections as an expense in the year of purchase. For fiscal year 1986, \$7,000,000 was charged to current funds for the acquisition of the Vever Collection although payments are to be made over several fiscal years.

10. Transfers among Funds

The following transfers among trust funds were made for the year ended September 30, 1986 in thousands of dollars:

	Current funds		Endow- ment and similar funds	Plant funds
	Unrestricted	Restricted		
Portion of investment yield appropriated (Note 4)	\$ (398)	\$ (389)	\$ 787	\$—
Income added to endowment principal	—	(159)	159	—
For plant acquisition	(50)	—	—	50
For special purposes	33	(33)	—	—
Endowment released	—	33	(33)	—
Reclassified as true endowment	—	(292)	292	—
Appropriated as quasi-endowment	(5,733)	(1,897)	7,630	—
Total non-mandatory transfers	(6,148)	(2,737)	8,835	50
Mandatory transfers for principal and interest	(37)	—	—	37
Total transfers among funds	<u>\$ (6,185)</u>	<u>\$ (2,737)</u>	<u>\$ 8,835</u>	<u>\$ 87</u>

11. Retirement Plans

The federal employees of the Institution are covered by the Civil Service Retirement Program. Under this program, the Institution withholds from the gross pay of each federal employee and remits to the Civil Service Retirement and Disability Fund (the Fund) the amounts specified by

such program. The Institution contributes 7% of basic annual salary to the Fund. The cost of the plan for the year ended September 30, 1986 was approximately \$6,462,000.

The Institution has a separate retirement plan for trust employees. Under the plan, both the Institution and the employee contribute stipulated percentages of salary, which are used to purchase individual annuities, the rights to which are immediately vested with the employee. The cost of the plan for the year ended September 30, 1986 was \$3,531,000. It is the policy of the Institution to fund plan costs accrued currently. There are no unfunded prior-service costs under the plan.

12. Income Taxes

The Institution is exempt from income taxation under the provisions of Section 501(c)(3) of the Internal Revenue Code. Organizations described in that section are taxable only on their unrelated business income, which for the Institution was immaterial in 1986.

It is the opinion of the Institution that it is also exempt from taxation as an instrumentality of the United States as defined in Section 501(c)(1) of the Code. Organizations described in that section are exempt from all income taxation. The Institution has not as yet formally sought such dual status.

13. Subsequent Event

On December 17, 1986, the Institution entered into a note agreement with the Riggs National Bank of Washington, D.C., for \$11,000,000. Proceeds from the note will be used to fund construction of a restaurant addition at the National Air and Space Museum. The note bears interest at a rate of 9% per annum and is payable in quarterly installments of interest only commencing on December 31, 1986, and principal and interest commencing on September 30, 1991, and ending on June 30, 1998.

RESEARCH

David Challinor, Assistant Secretary for Research

Joseph Henry Papers

The Joseph Henry Papers project has published five of its contemplated fifteen volumes, dealing with Joseph Henry's early years and life at Albany and Princeton. Work progressed during the past year on the sixth volume, 1844-46, covering Henry's career at Princeton and his selection as Secretary of the Smithsonian Institution.

Dr. Nathan Reingold, editor of the Joseph Henry Papers since the inception of the project, left to become senior historian at the National Museum of American History. Dr. Marc Rothenberg, who had served as associate editor, was promoted to editor.

An important development for the project was the installation of office automation equipment. These computers and word processors greatly facilitate the review

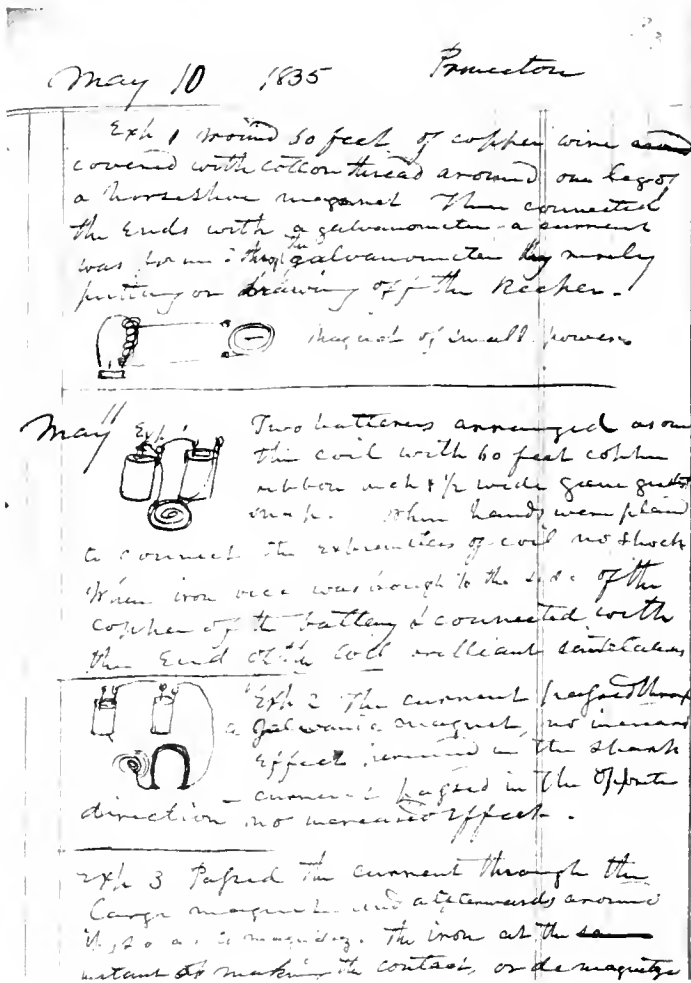
and revision of typescripts of documents, reduce errors, and decrease the time needed for editing documents.

The project again sponsored its Nineteenth Century Seminar Program, hosting presentations reflecting a broad range of historical interests, including the history of science and technology, anthropology, art, and American social and cultural history.

Henry Papers staff cooperated with other museums in the preparation of exhibitions, including the National Museum of Natural History's major exhibition, *Magnificent Voyagers: The U.S. Exploring Expedition, 1838-1842*, which opened in November. Dr. Rothenberg, together with Dr. Reingold, organized a symposium, "Men of Daring, Triumphs of Exploration," in connection with the opening of the exhibition. Dr. Paul Theerman worked with the National Museum of American History staff on an exhibition about Isaac Newton, scheduled to open in 1987.

In addition, Henry Papers staff participated in several professional conferences during the past year: the annual meeting of the History of Science Society, the joint meeting of the British Society for the History of Science and the British Society for the Philosophy of Science, the Sixth International Conference of Historical Geographers, and the Joseph Henry Science Symposium held at Albany, New York.

This detail of an entry from Joseph Henry's "Record of Experiments" is dated May 10, 1835. (Courtesy Smithsonian Archives)



National Zoological Park



Two of the four dama gazelles (*Gazella dama*) born at the National Zoo last spring and summer are shown with their parent.

The National Zoological Park (NZN) maintains a public collection as well as research, maintenance, education, and animal health facilities on 163 acres at Rock Creek in Washington, D.C., and a Conservation and Research Center (CRC) on a 3,000-acre site at Front Royal, Virginia. The National Zoo is dedicated to diverse goals: public education about the welfare of animals, recreation of visitors, advancement of biological and veterinary sciences, and conservation. In cooperation with zoos throughout the world, the National Zoo works to save

endangered species by using the most modern techniques of reproductive biology and animal husbandry and by promoting habitat preservation. Habitat preservation is aided by NZN ecological studies throughout the world, programs of basic research, and training programs for Third World wildlife biologists.

In 1986, the National Zoo took the first steps towards breaking down the unnatural separation of the world of animals from the world of plants, inextricably interdependent in the real world.



The first flamingo (*Phoenicopterus ruber*) egg was laid at the National Zoo in May 1986.

Animal Exhibits

The public exhibits at Rock Creek are divided into the mammalogy, ornithology, herpetology, and invertebrate departments. Invertebrates constitute more than 99 percent of the animal kingdom in the number of species but were not represented at the National Zoo before Dr. Michael H. Robinson became director in 1984. He instituted an invertebrate exhibit under the leadership of Jaren Horsley. This exhibit will open in 1987.

A total of 3,300 animals are in the Rock Creek exhibits. In 1986 Dr. Benjamin Beck, research primatologist, was promoted to general curator, with over-all responsibility for the entire animal collection. This appointment represents a re-emphasis on the central importance of exhibits to the role of a zoo. Each year a spate of births testifies to the good health and excellent welfare of the animals in the Zoo's care. In 1986 there were 1,265 births (Rock Creek and Front Royal combined). These included a Masai giraffe—born in front of an audience of over

500 people in July—and young of such critically endangered species as spectacled bears (twins), golden-headed lion tamarins (the first such birth in the United States), and golden lion tamarins. Springtime saw births of dama and dorcas gazelles, blesbok, bongo, gnu, bobcat twins, Geoffroy's cats, white-cheeked gibbons, and many other mammals. Birds, snakes, lizards, and frogs also bred well, and there were hatchings of several species never before bred at the National Zoo.

Species were added to the collection as founders in new breeding programs. These included a pair of Malaysian tapirs, a male Indian rhino, a male Sumatran tiger, and the New Zealand green gecko. Among other popular arrivals were two young gorillas on loan from the Milwaukee and Brookfield (Chicago) zoos. Extensive renovations to the filtration systems in the seal and sea lion enclosures has produced crystal-clear water to the delight of visitors. Further mixed species groupings have been incorporated into existing exhibits to produce the natural ecosystem flavor envisaged in the NZP biological park concept. Crowned cranes are now exhibited with the dama gazelles; humming birds and predatory fishes were added to the crocodile exhibits; and birds are successfully coexisting with a variety of mammals in the Small Mammal House. New construction completed in September transformed the beaver exhibit. The beavers are now expected to fascinate visitors with their full repertory of tree-cutting and dam-building behaviors.

Exchanges with other zoos foster good international relations. The National Zoo sent gifts of a pygmy hippopotamus to Sri Lanka, two red pandas to Japan, and bushdogs to Panama. The NZP breeding group of fennec foxes was strengthened by the gift of new stock from the people of Israel. Senior and experienced National Zoo staff actively helped develop new zoos overseas. Charles Pickett, assistant curator of ornithology, and William Xanten, collection manager, worked with the U.S. Fish and Wildlife Service to aid the Pakistan government in developing a national zoo and a master plan for the zoos of that country.

Animal departments staff continue to carry out research, contribute to education, and aid other zoos. Dr. Edwin Gould commenced a study of the star-nosed mole. Dr. Gould also developed a volunteer gardener program in conjunction with the Friends of the National Zoo and the NZP Office of Facilities Management. Volunteer gardeners will beautify the Zoo and also add to the flowering plants that are already attracting butterflies back to the park. Dr. John Seidensticker, associate curator of mammals, studied the ecology of exhibit environ-

ments with the aim of enriching them. As a result of his innovations, many animals are more active and interesting to watch. Dr. Dale Marcellini, curator of reptiles, visited New Zealand with keeper Trooper Walsh to collect green geckos for a breeding colony. Keeper of reptiles Cecilia Chang collected frogs in Panama and helped establish breeding groups of Panamanian species.

Conservation

The Conservation and Research Center (CRC) is the home of the Department of Conservation, which is dedicated to saving rare and endangered species by propagation and research. Great successes in rare animal propagation in 1986 included births of clouded leopards, Eld's deer, scimitar-horned oryx, sable antelope, marsupial tiger quolls, and Przewalski's horse. Among the birds, further hatchings of endangered Guam rails and Micronesian kingfishers testify to a successful breeding program, and red-crowned cranes were hatched for the first time ever at the National Zoo. The Center has continued to be a leader in the Guam birds rescue project—thirteen more rails were added to the breeding stock. In this connection Dr. Scott Derrickson presented a paper at the American Association of Zoological Parks and Aquariums annual conference on "A Co-operative Breeding Program for the Guam Rail (*Rallus owstoni*)."

The National Zoo makes a major contribution to tropical conservation by organizing a Wildlife Conservation Training course, directed by Dr. Rasanayagam Rudran and supported by a range of conservation groups. This year one course was held at Front Royal and was attended by students from eleven countries. Other courses were held in Venezuela and Malaysia. On-site courses and those held at Front Royal are rapidly making the CRC known worldwide as a training center for Third World biologists and wildlife specialists. Dr. Christen Wemmer, assistant director for conservation and captive breeding, presented a number of major papers at scientific meetings. His subjects included tiger conservation, behavioral research at zoos, and the biology of Reeves' muntjac. "Man and Beast Revisited," a major international symposium jointly organized by the National Zoo and the Office of Smithsonian Symposia and Seminars, attracted scholars from a variety of disciplines to discuss the relationship between animals and man, the evolution of language, and advances in the study of man's ancestry.



National Zoo keeper Carolyn Bocian plays with new juvenile gorillas (*Gorilla g. gorilla*) Kuja and Mandara in the Great Ape House. The rambunctious youngsters are on loan to the National Zoo from the Milwaukee Zoo and the Brookfield Zoo in Chicago.

Education and Public Affairs

The Office of Education brings to a wide audience such issues as the role of zoos in biological education and the need for worldwide efforts in environmental and wildlife conservation. It also emphasizes the urgent need for the humane treatment of animals. In 1986, for the first time, the Office of Education produced an interactive series of exhibits, funded by the recently established Smithsonian Institution Special Exhibits fund, called ZooArk. Six exhibit modules located at six sites within the Zoo used quizzes, computer games, vivid graphics, and a range of artifacts to involve visitors in learning about the problems facing wildlife worldwide. The exhibits' theme emphasizes that many species are "threatened in the wild; protected in the zoo."

During the year the Office of Education successfully introduced *The National Zoo News*, a newspaper for Washington, D.C., area teachers. The office also produced hands on outreach kits for lower elementary

school students. These kits cover reptiles, birds, and mammals and parallel the work of the National Zoo's ZOOlab, HERPlab, and BIRDlab. In 1986 these learning laboratories attracted many visitors including Mrs. Hosni Mubarak, first lady of Egypt, and educators from Japan, Australia, and India. Indian environmental educators have established a learning laboratory based on the NZP model. The successful two-day symposium, "Research and Conservation at the National Zoo," was attended by high school teachers and students.

The Zoo's Office of Public Affairs organized a public symposium, "Wildlife Survivors in the Human Niche," which filled the Zoo's 300-seat auditorium. A major symposium on successful alternatives to the destruction of tropical forests attracted national attention and will lead to a major book. This symposium was organized jointly by the Office of the Director and the Office of Public Affairs, with Judith Gradwohl and Russell Greenberg being principal organizers.

Sunset Serenades, a series of eight weekly concerts proved to be a popular summer event for the third year. These concerts were produced and managed by the Office of Public Affairs, and introduced as many as 600 people per concert to the benefits of summer evenings at the Zoo. The office continued to provide information through the press, radio, and television about the activities and programs of the National Zoo, resulting in increased coverage of achievements in research, conservation, captive breeding, and education.

Animal Health and Pathology

The Department of Animal Health (DAH) provides outstanding health care for the animals at Rock Creek and at Front Royal and conducts clinical research to advance the care of wildlife and examine problems of reproductive physiology. The department also plays a major role in the predoctoral and postdoctoral training of zoo veterinarians.

In 1986 unusual cases of health care included the treatment of a gastric ulcer in a gorilla, root canal dentistry on the canine tooth of a female lion, and support dentistry on the fractured tusk of an African elephant. Clinical research involved study of antibiotic treatment of zoo animals, further development of anesthetic and dental techniques for nondomestic animals, and testing of canine distemper vaccination for red pandas.

The National Zoo through DAH, and DAH research associate Dr. Stephen O'Brien of the National Cancer

Institute, established the Center for New Opportunities in Animal Health Sciences. The Center was founded to attract private money to support programs in reproductive physiology, applied medical research, and related subjects for the successful propagation of nondomestic animals. Dr. Lynn Dolnick heads the Center's fund-raising activity.

Staff from DAH collaborated with the NZP Office of Facilities Management and architects in developing the final plans for a new and adequate hospital at Rock Creek to replace the outmoded 1969 building. This new building will also house NZP's Department of Pathology (DOP) which provides diagnostic services as well as carrying out extensive teaching and applied research.

Research at the Department of Pathology concentrates on improving the health of zoo animals and developing prophylactic measures against infections. Dr. Richard Montali, head of Pathology, in conjunction with Dr. Lyndsay Phillips of Animal Health has been investigating techniques for identifying birds infected by avian tuberculosis. Dr. Don Nichols has been studying meningeal worm infections in exotic wild animals. The studies are of great importance since native deer are carriers of this disease. In an attempt to provide control mechanisms and prevent transmission from native to exotic animals Mark Rowley, a graduate student working at Front Royal, has studied snails and slugs that are intermediate hosts of the meningeal worm. He found that in some pastures 2.2 percent of all slugs and snails harbor the infective stage of the worm. Dr. Montali, with the North Carolina Zoo and a University of California facility in La Jolla, California, studied a digestive tract disease of colobus monkeys caused by gluten, a component of wheat. The disease in monkeys has similarities to celiac disease in humans.

Nonmedical Research

NZP's Department of Zoological Research provides scientific support for conservation, research, and education. The department collaborates with a range of outside scientific bodies including those of other Smithsonian bureaus—currently in more than seventy-five projects. Research ranges geographically from Sri Lanka to Venezuela and Brazil. In 1986 research subjects included continuing studies of golden lion tamarins, new studies of golden-headed lion tamarins, research on giant panda vocalizations, studies of the social behavior and movement patterns of the endangered California sea otter, re-

search into genetic variation in mammals, studies of the behavior of migratory birds, and nutritional studies on the milk composition of a wide range of mammals.

Dr. Devra Kleiman, assistant director for research, was elected a Fellow of the Animal Behavior Society and was appointed field editor of the new journal *Conservation Biology*. Dr. Kleiman continued to head the International Golden Lion Tamarin Management Committee. Dr. Eugene Morton was elected to the governing council of the American Ornithologists Union. Dr. Katherine Ralls visited China at the invitation of the Chinese government to participate in a workshop on the management of endangered marine mammals.

Dr. Morton, with his students and associates, continues to study complex communication and social behavior in birds. His studies centered on purple martin social systems, and sex differences in habitat preferences and feeding activities in hooded warblers. Dr. Russell Greenberg and Dr. Morton studied the development of foraging and food-finding behavior in migratory birds. Dr. Morton, in collaboration with Lisa Forman, started studies on the genetics of mate choice; with Cathy Blohowiak, at CRC, he studied mate choice in captive-raised black ducks.

Dr. Olav Oftedal, NZP nutritionist, carried on collaborative studies of hooded and harp seal milk and growth patterns, similar studies of black bears in Pennsylvania, and red pandas at the National Zoo. Dr. Daryl Boness continued collaborative studies on seals with Dr. Oftedal and conducted a reconnaissance trip to Hawaiian monk seal breeding grounds to determine the feasibility of a comparative study on the mating system and parental care of these seals. Dr. Rasanayagam Rudran continued studies of a red howler monkey population in Venezuela. In addition to the Front Royal Wildlife Training Course, Dr. Rudran gave courses in Venezuela and Malaysia.

Mary Allen, Dr. Oftedal, and Dr. Dale Marcellini collaborated with scientists at the Smithsonian Tropical Research Institute on a program to raise green iguanas as an alternative food source for tropical peoples. Jonathan Ballou continued research on the effects of inbreeding in nondomestic animals. This work has important implications for the husbandry of small populations of endangered species. Miles Roberts completed studies of tarsier reproduction. Dr. Steven Thompson and Dr. Theodore Grand collaborated on studies of the relationship between skeletal mass and metabolic rate. Dr. James Deitz and Lou Ann Deitz continue to play a major role in the golden lion tamarin reintroduction program in Brazil, along with Dr. Devra Kleiman and Dr. Benjamin Beck.



Mandara, a juvenile female gorilla (*Gorilla g. gorilla*), settles into her new home in the Great Ape House at the National Zoo.

Construction and Support Services

George Calise, assistant director for support services, is responsible for the Office of Facilities Management, the Office of Construction Management, and the Office of Police and Safety, as well as other smaller units. These units provide the often unseen backbone of the entire Zoo operation. In 1986 two major construction projects were completed. The first section of Olmsted Walk was completed on schedule. Two other sections of the walk will complete the entire project. The new veterinary hospital was completed at Front Royal. Also completed in 1986 was the extensive remodeling of the Reptile House basement for the world's first Invertebrate House. In late 1986 construction of a new gibbon exhibit started.

Friends of the National Zoo

Financial Report for the Period January 1–December 31, 1985
(in \$1,000s)

	Net revenue	Expense	Net increase/ (decrease) to fund balance
Fund Balance @ 1/1/85			\$1,675
Services			
Membership	\$ 639	\$ 524	115
Publications	148	160	(12)
Education ^a	103	766	(663)
Zoo Services ^b	<u>5,291</u>	<u>4,467^c</u>	<u>824</u>
Totals	<u>\$6,181</u>	<u>\$5,917</u>	<u>\$ 264</u>
Fund Balance @ 12/31/85			<u>\$1,939^d</u>

^aExcludes services worth an estimated \$598,500 contributed by FONZ volunteers.

^bIncludes gift shops, parking services, and food services.

^cIncludes \$431,586 paid during this period to the Smithsonian Institution under contractual agreement.

^dNet worth, including fixed assets, to be used for the benefit of educational and scientific work at the National Zoological Park.

The Office of Graphics and Exhibits collaborated in the design of the renovated beaver exhibit, produced an acclaimed labeling system that provides information about more than 100 trees in the park, and gave support for a series of symposia and special events. The Facilities Management team provided the skilled direction and work force for most projects that transformed existing exhibits in the NZP modernization program.

Park security and law enforcement remain at high levels. The creation of a new position of deputy chief for security has been an important step in insuring the maintenance of a pleasant ambience at large public events. Captain George P. Day was appointed deputy chief for security and Lieutenant James D. Jackson became commanding captain of police. The Office of Police and Safety continues to improve safety consciousness among Zoo employees.

research. Volunteer contributions expanded substantially. The third National ZooFari, an outdoor evening entertainment and silent auction planned by FONZ directors, produced a \$45,000 addition to the Theodore H. Reed Animal Acquisition Fund. Grant support of NZP-directed wildlife studies reached \$499,000 in 1986. FONZ staff managed volunteer operations of a dozen education and information services. Membership has grown to 60,000, and the annual members' ZooNight was one of the most successful.

Services for visitors grew in 1986, with improvements in food display, addition of snack and gift carts, training and uniforming of traffic aides, and changes in management procedures.

Financial information for calendar year 1985 is given below. A percentage of revenues from Zoo Services is paid to the Smithsonian for the benefit of the National Zoo and is reported as income by the Institution.

Friends of the National Zoo

The Friends of the National Zoo (FONZ) in 1985 and 1986 enjoyed the most successful years ever providing support of Zoo efforts in education, conservation, and

Office of American Studies

The Office of American Studies continued its program in graduate education throughout the year. The 1985 fall semester seminar in Material Aspects of American Civilization had as its theme "Material Aspects of Exploration and Travel," and was taught by the director of the program, Dr. Wilcomb E. Washburn, and Professor Bernard Mergen of George Washington University.

Other seminars during academic year 1985-86 included "The Decorative Arts in America," taught by Barbara G. Carson, and "Studies in American Art and History," taught by Lillian B. Miller. Individual graduate students continued to pursue specialized research under the supervision of the director of the Office of American Studies.

The director of the Office of American Studies continued his research and publication activities. Among the tasks brought to near completion was editorial work on volume IV, the Indian-White Relations volume of the *Handbook of North American Indians*.

Office of Fellowships and Grants

The Office of Fellowships and Grants continues to serve as a link between the Institution and scholars throughout the world. The office encourages research by persons from universities, museums and research organizations in the fields of art, history, and science. It brings scientists and scholars to all parts of the Smithsonian to utilize the unique resources available, as well as to interact with professional staff. At present, a number of research support programs are developed and managed by the office to assist visiting students and scholars. These programs provide opportunities for research to be conducted at Smithsonian facilities in conjunction with staff members. Residential appointments are offered at the undergraduate, graduate, and professional levels.

Academic programs at the Smithsonian are an important complement to those offered at universities. The national collections and the curators who study them are unparalleled resources that are not available anywhere else and are essential to scholarly research. At the Smithsonian, historical and anthropological objects, original works of art, natural history specimens, living plants, animals, and entire ecosystems are available for study.

The Office of Fellowships and Grants administered a variety of academic appointments in 1986. The program of Smithsonian Research Fellowships, begun in 1965, offered eighty predoctoral, postdoctoral, and senior postdoctoral fellowships this year. Sixteen of these fellowships were awarded to international applicants from ten countries. These appointees pursue independent research projects under the guidance of staff advisors, usually for periods of six months to one year in residence at one of the Institution's bureaus or field sites.

Topics of study for Smithsonian fellows included: the migration and employment transition of African-American women, 1890-1930; the patterns of evolution in herbivorous mammal-like reptiles from the Beaufort Group (Permo-Triassic) of southern Africa; mechanics, mathematics, and machines in the culture of the Renaissance; man and nature in Winslow Homer's Adirondack pictures; Tarahumara Indian ethnoarchaeology, cooking pots, and grinding stones; and kinetics and ecology of flight in butterflies.

Twenty-one graduate students, eight of whom are foreign and represent seven countries, were offered fellowships for ten-week periods during 1986. The participants are usually junior graduate students beginning to explore avenues that develop into dissertation research. This year some of these fellows studied the introduction of modern German art into New York City, 1905-39, and its recep-

tion and influence; the minerology and petrology of meteorites; the incidence of blood and intestinal parasitism in an insular avifauna; technology, gender, and economics in computer programming; and differences in salamander species diversity between disturbed and undisturbed habitats.

In addition to the general program funded through the Office of Fellowships and Grants, competitions for fellowships are also held for specific awards. At the National Air and Space Museum, the recipients of the A. Verville Fellowship, the International Fellowship, the Martin Marietta Chair in Space History, and the Charles A. Lindbergh Professor of Aerospace History will be in residence.

In 1986 three fellowships were awarded through the Jessie Smith Noyes Foundation to Latin American students to conduct research using the facilities at the Smithsonian Tropical Research Institute. Sonia Ortega was awarded a postdoctoral fellowship to conduct research on the distribution and abundance of rocky intertidal organisms on the Caribbean coast of Panama. Guadalupe Williams-Linera, a predoctoral student at the University of Florida, will be in residence studying the development of tropical-edge vegetation and forest structure; and Gonzalo Castro, a predoctoral student at the University of Pennsylvania, will conduct research on the latitudinal gradient in the daily energy expenditure of the sanderling (*Calibris alba*).

The Smithsonian Astrophysical Observatory awarded four postdoctoral and three predoctoral fellowships. Some of the topics of study included: planet forming processes in the solar nebula, the large scale distribution of galaxies, and theoretical models for physical conditions in the atmospheres of early time type II supernovae.

A number of senior fellowships continued to be offered at the Institution. Smithsonian Institution Regents Fellows in residence this year include Richard Bushman, professor of history at the University of Delaware, who spent eight months at the National Museum of American History studying early American material culture. In residence at the Smithsonian Astrophysical Observatory was Frank Wilczek, professor of astrophysics at the University of California, Santa Barbara and member of the Institute for Theoretical Physics. Sidney Mintz, professor in the Department of Anthropology at Johns Hopkins University, will be in residence at the National Museum of Natural History conducting research on sugar consumption in the Americas.

To honor Regent Emeritus James E. Webb, the Institution established a fellowship program in his name designed to promote excellence in the management of cultural and scientific nonprofit organizations. Six awards were offered in 1986. Webb Fellows are appointed for two years and become members of the Webb Fellows Society. In 1986 two luncheon meetings of the society were held at which several senior staff were included to discuss the shape and administration of the Webb Fellowship Program and the Institution.

In 1984, the Smithsonian received a three-year grant from the Rockefeller Foundation Residency Program in the Humanities for postdoctoral fellowships at the National Museum of African Art and the Center for Asian Art. The grant supports research in residence at the museums in the areas of African art history and anthropology, especially material culture, and in Asian art history for research in the collections on topics that may initiate scholarly symposia, exhibitions, and other major museum activities. The recipient at the National Museum of African Art, Christraud Geary, from Boston University, will study historical photographs as sources for research on African art history and history. Wheeler Thackston, from Harvard University, is the recipient at the Center for Asian Art and will study Persian sources relating to the calligraphers, artists, and artisans of the Timurid period.

During 1986 bureaus continued to offer support for visiting scientists and scholars in cooperation with the Office of Fellowships and Grants. These awards made possible visits to the Smithsonian by thirty-six persons. The office also expanded the Short Term Visitor Program. In 1986, 124 persons came to the Institution to conduct research, study collections, and collaborate and confer with professional staff. Of these 124 people funded through the Short Term Visitor Program, fifty-nine were international, representing thirty-one foreign countries. In 1986 the office provided funding for twelve workshops designed to bring scholars together from a variety of fields to discuss subjects of common or complementary interest. Topics for these workshops included: American labor history, tropical forest conservation, and human skeletal paleopathology.

The expanded role of internships in the academic community continues to be reflected by support for interns within the Institution. The National Air and Space Museum funded six interns through the office this year. The Cooper-Hewitt Museum again appointed four students under the Sidney and Celia Siegel Fellowship fund. In-

ternships in environmental studies at the Smithsonian Environmental Research Center also continued. The Smith College–Smithsonian Program in American Studies is now in its seventh year, and six students will participate in a seminar course and conduct research projects under the direction of staff members through this program. The Hirshhorn Museum and Sculpture Garden continued its internship program with two interns in residence. In 1986 the National Museum of American Art provided support for four interns. The Office of Elementary and Secondary Education's high school internship program continued in 1986. Forty interns were in residence for two five-week sessions to participate in a program designed to broaden an existing academic interest or to expand a vocational skill. Also, the Office of Fellowships and Grants administered five appointments for the Teacher Intern Program coordinated by the Office of Elementary and Secondary Education. This program allows high school teachers to learn more about their academic disciplines and assist museum programs for adolescents in their home communities.

For the fifth year the office has offered academic opportunities aimed at increasing minority participation in Smithsonian programs. The opportunities include fellowships for minority faculty members and faculty from minority colleges and internships for minority undergraduates and graduate students. Awards were made to twenty-one interns who were placed at a variety of bureaus and offices on the Mall; the Smithsonian Environmental Research Center; the Cooper-Hewitt Museum; and the Archives of American Art, Los Angeles Area Center.

The Office of Fellowships and Grants also awarded seven fellowships to faculty persons to conduct research on subjects such as development of the synthetic dye industry in the United States, 1860–1920; the role of sports in Afro-American community life during the Jim Crow era, 1896 to 1954; and salinity tolerance assessments of the mangrove ferns *Acrostichum aureum* and *A. danae-folium* of Panama.

In 1986 the office continued the administration of the Smithsonian's cooperative education program. This student employment program encourages minority graduate students to work in professional and administrative positions at the Institution—separated by periods of study at their university—and offers the potential for permanent employment at the Smithsonian.

The Education Fellowship Program has also been initiated to encourage minority participation in Smithsonian

fields of research. The fellowship offers support for graduate education and research training to minority students. This year the Smithsonian Astrophysical Observatory and the National Museum of Natural History each jointly supported with the office a student under this program.

The American Indian Program provides opportunities for North American Indians—including Native Americans from the United States, Mexico, Canada, Hawaii, and U.S. Trust Territories—to pursue research utilizing Smithsonian collections relating to their cultures. In many cases these opportunities better enable them to interpret and maintain collections in their native museums and archives. The American Indian Program is designed to support directed and independent research appointments. In 1986 six appointments were made. Some of the topics studied included: the National Congress of American Indians and its involvement in American Indian higher education; James Mooney—historic American Indian populations and epidemiology; and Chippewa musical heritage and reservation history.

The Visiting Associates Program was begun in 1986 to increase minority participation in Smithsonian research and study programs. University and college faculty and administrators who have a commitment to expanding minority participation in higher education visit the Smithsonian to learn about ongoing research and research opportunities. The associates will be asked to serve as resource contacts and will disseminate Smithsonian research opportunities information to their respective academic communities. In 1986 twelve appointments were made for two one-week sessions in the spring and fall.

Smithsonian Astrophysical Observatory

Several long-standing notions about the cosmos were both challenged and confirmed in the past year by Smithsonian Astrophysical Observatory (SAO) scientists, who produced a new map of large-scale structure in the universe, revised the distance measurement to the center of the Milky Way, identified the best candidate for a black hole, and found new clues to the birth of stars.

Other SAO astronomers, using a radio interferometry technique, found some ten newborn stars, each about thirty times more massive than the Sun, in the core of a dense cloud of molecular dust and gas near Sagittarius. The results provide the best evidence to date that stars form out of rapidly spinning dust clouds.

SAO scientists continued research in the space sciences, analyzing data provided by satellite-, balloon-, and rocket-borne telescopes. The observatory also maintained leadership in the development of new detectors and instrumentation for astronomy.

The SAO research programs are carried out in close cooperation with the Harvard College Observatory through a joint venture known as the Center for Astrophysics. The results of these studies are published as scientific papers, typically numbering more than 200 per year.

SAO also conducts regular programs of public information and education, including popular lectures, Observatory Nights for the Public, in Cambridge, Massachusetts, and guided bus tours of the Whipple Observatory in Arizona. Understandably, many of the public activities of the past year concerned the return of Halley's comet.

Atomic and Molecular Physics

Interpreting observations of astronomical objects requires detailed information about the atomic and molecular processes underlying their physical conditions. The major objective of research in this division is to obtain atomic and molecular data through laboratory and theoretical studies.

For example, oxygen molecules in the atmosphere are broken down by ultraviolet sunlight absorption to create the atoms needed for the formation of ozone in the stratosphere—the atmospheric layer that screens out much of the Sun's harmful ultraviolet rays. For the first time, accurate laboratory measurements were made of this molecular absorption. Future measurements will concentrate on those regions of the solar spectrum where ultraviolet absorption by oxygen is small. Because this type of solar radiation can penetrate deep into the strato-

sphere, it may alter the altitude profile of ozone and other trace constituents thought responsible for the "greenhouse effect" warming the Earth.

In addition to oxygen, many other molecules, both simple and complex, survive in large concentrations in the seemingly hostile interstellar space. However, some of these molecules are thought to be destroyed in space by ultraviolet light, which breaks them into fragments. Understanding of this destructive process is especially limited for *radicals*—molecules whose chemical reactions are so rapid that it is extremely difficult to obtain sufficient laboratory concentrations for study. Using theoretical approaches, SAO scientists showed that even the simplest and most abundant radicals produce light in a large variety of colors. These studies provide a framework for understanding how complex interstellar molecules are formed, undergo chemical changes, and are destroyed.

High Energy Astrophysics

Research concerns astronomical objects emitting a substantial fraction of their energy in X-rays. Since X-rays are absorbed by the Earth's atmosphere, observations must be made from balloons, rockets, or satellites. SAO scientists and engineers are involved in the analysis of existing X-ray data as well as the design and development of new instrumentation for future space missions.

This year, SAO scientists discovered a new black hole candidate in the Milky Way, the third and most convincing such system identified to date. The technique developed to find this rare object—through observations of its visible light counterpart—can now be applied to search for additional members of this class.

Analysis of data from the Einstein Satellite Observatory revealed a high-density, relatively cool, X-ray-emitting gas in the central regions of some galaxies. As this gas cools, it condenses to form new stars; in other words, these otherwise "old" galaxies still show activity characteristic of younger galaxies.

SAO scientists used observations of quasars—extremely luminous objects at the core of some galaxies—to demonstrate that their X-ray emission exhibits essentially a universal signature, and therefore provides a very efficient way to find quasars. This result is important for understanding the development of certain properties of the universe over the past fifteen billion years.

SAO scientists and engineers are working with the National Aeronautics and Space Administration and industry on detailed definition and design studies of the Ad-



The Multiple Mirror Telescope operated by the Smithsonian Institution and the University of Arizona atop Mt. Hopkins in southern Arizona is seen here from its observing chamber. (Photograph by Dane Penland)

vanced X-ray Astrophysics Facility. With its large increase in angular resolution and sensitivity over previous X-ray satellites, this facility has great potential for answering fundamental questions and revealing previously unknown phenomena.

Optical and Infrared Astronomy

This division studies the large-scale structure of the universe and the formation and evolution of stars and stellar systems. In support of this and other research, SAO operates the Fred Lawrence Whipple Observatory on Mt. Hopkins in Arizona, the site of the Multiple Mirror Telescope (MMT), operated jointly with the University of Arizona. The MMT is the third largest optical telescope in the world, and the first of a new generation of advanced-technology telescopes. Also at Mt. Hopkins are two smaller telescopes especially effective for large-

scale surveys. In addition, a 10-meter-diameter light collector at the Whipple Observatory represents the world's most sensitive device for ground-based searches for high-energy gamma rays from celestial sources.

Astronomers discovered a remarkable and fundamental property of the universe—galaxies seem to congregate on the surfaces of giant bubblelike voids that can be 100 to 150 million light years in diameter. The Whipple Observatory is being used to explore the bubble structures.

Cosmic rays have been a great puzzle to scientists because no satisfactory explanation has been found for how the rays are created. Observations with the 10-meter instrument at Whipple Observatory led to the suggestion that cosmic rays may be produced by a handful of very rare star systems in our galaxy. Each such system contains two stars orbiting about one another—one star, collapsed under its own gravity, creates the environment needed to produce the very-high-energy particles that constitute the cosmic rays.

Planetary Sciences

Planetary sciences research strives to understand the planets, satellites, and small bodies of the solar system, as well as the processes that created them. Optical observations of newly discovered, faint, or unusual minor planets and comets are made at the Oak Ridge Observatory in Massachusetts and are closely coordinated with the International Astronomical Union's Minor Planet Center and Central Bureau for Astronomical Telegrams, both operated by SAO.

Division scientists were involved in research concerning the 1985–86 appearance of Halley's comet, including measurements of the nucleus—the first glimpse ever of the heart of a comet. These measurements confirmed and extended the famous “dirty snowball” model of a comet's nucleus developed by a member of this group.

The *Voyager* missions discovered Saturn's outermost ring to be curiously uneven in brightness: two bright regions 180 degrees apart are separated by two darker regions. The SAO scientist who mapped these variations explained this irregularity as a tendency of the particles to cluster gravitationally in aligned arrays, reflecting light better in one direction than in the direction perpendicular to it.

Studies of lunar samples collected by the Apollo astronauts continued. The *Apollo 16* site, located in the central highlands of the Moon, consists of layers of debris splashed to the site from giant impacts that created the large basins approximately 3.9 billion years ago. SAO studies show that the impact that formed the Imbrium Mare basin appears to have occurred some 50 million years earlier than was previously thought, providing a more accurate chronology of the Earth-Moon system.

Radio and Geoastronomy

Radio astronomy programs concentrate on the structure, evolution, sources of energy, and ultimate fate of radio wave-emitting astronomical objects distributed throughout the universe. Division scientists are also using radio astronomy techniques to measure continental drift and to probe the interior structure of the Earth, while others are developing atomic clocks and testing the theory of general relativity.

By measuring with extraordinary precision the motions of masers—formed from water vapor that surrounds a newly formed massive star near the center of the Milky Way—SAO scientists directly measured the distance to

the center of the Milky Way to be 23,000 light years. This value is considerably smaller than the standard value of 33,000 light years used for the last two decades, and will have a major impact on understanding of the distance between objects in our galaxy.

Other SAO scientists and their Harvard collaborators used the Very Long Baseline Interferometry technique to make one of the first precise measurements of the distance from Earth to an astronomical object outside our galaxy—Supernova 1979C in the spiral galaxy M100 in the Virgo cluster. They determined the distance from Earth to the supernova to be about 20 megaparsecs (with an uncertainty of about 7 megaparsecs), or approximately 60 million light years. The ability to measure extragalactic distances is central to many cosmological issues, including the size, age, structure, and ultimate fate of the universe.

SAO researchers and their Harvard colleagues obtained the first detailed evidence that infrared sources associated with dense cores contain, and are powered by, extremely young, low-mass stars. Moreover, the circumstellar matter near these stars typically has a “cavity” containing a flattened structure, or “disk,” which may eventually form planets.

Optical interferometry seeks extremely high angular resolution by extending interferometric techniques developed for radio astronomy to optical wavelengths. For example, a 20-meter-long stellar interferometer being installed at the Mt. Wilson Observatory—as part of a joint SAO, Massachusetts Institute of Technology, Naval Research Laboratory, and U.S. Naval Observatory project—is expected to be 10 to 100 times more accurate than conventional optical telescopes for determining positions of stars.

An orbiting, dual, optical interferometer has been designed to make measurements of positions of astronomical objects with errors at the microarcsecond level. (A microarcsecond is the angular size of the thickness of a dime on the Moon as seen from Earth.) This spaceborne instrument will be used to search for other planetary systems, conduct a new test of general relativity, and improve the cosmic distance scale through extension of triangulation to much greater distances.

The previous highest stability for atomic clocks, all operating at room temperature, had been equivalent to the loss of less than 1 second in 100 million years. An SAO- and Harvard-designed clock was successfully operated at a temperature within one-half degree of absolute zero and is expected to be 1,000 times more accurate.

Solar and Stellar Physics

Investigations are directed toward understanding the physical processes operating in the Sun and stars. Stars like the Sun are studied to understand the dependence of their properties on age, on composition, and on their physical associations in pairs and in groups. Other research includes examination of the behavior of hot gas in extended stellar atmospheres, in the interstellar medium, and in material ejected from young stars and supernovae.

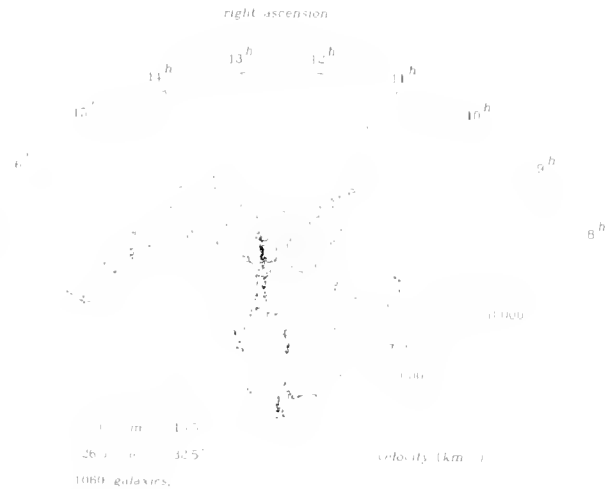
Noteworthy this year was the discovery of a flattened, rotating gas cloud surrounding a very young star. Study of spectra obtained at Mt. Hopkins and at Kitt Peak National Observatory revealed evidence of a thin gaseous disk orbiting the star, perhaps indicating a planetary system in the process of formation.

Supernova remnants contain material violently ejected by a dying star, as well as interstellar gas heated to hundreds of thousands of degrees by the expanding shock wave. The hot material is observed as long, narrow filaments. Physicists at SAO, the California Institute of Technology, and the University of Wisconsin hypothesized that these filaments are ripples in a very large, thin sheet of glowing gas; observations of predicted gas motion confirmed the hypothesis. Previously, theorists had assumed interstellar space was filled with small, discrete clouds of dense gas immersed in a much lower density background gas. The recent observations suggest there may be other ways by which stars and planets are formed out of the materials in space.

A new technique of astronomical imaging that overcomes the normal blurring caused by motions in Earth's atmosphere, combined with sophisticated data analysis techniques, was used to reveal a faint companion to one of the brightest stars in the sky—Betelgeuse. The new technique may make it possible to search for other low-mass stellar companions as well as planetary systems.

Theoretical Astrophysics

Theoreticians at SAO study astronomical systems by physical analysis and mathematical modeling. Topics investigated include interiors of neutron stars, properties of atoms and molecules in interstellar space, formation of spiral structure in galaxies, behavior of high-temperature plasmas, and formation of planets in the early solar system.



This two-dimensional representation of galaxy distribution in a narrow, deep slice of the sky shows that the galaxies lie on the surfaces of large, bubblelike voids up to 150 million light years across. (Map by Valerie de Lapparent, Margaret Geller, and John Huchra)

One exciting recent theory in cosmology is the “new inflationary universe,” which suggests the universe underwent a phase of rapid expansion early in its history—almost immediately after the “big bang”—when particle energies were enormous. The existence of this expansion, or “inflationary” phase explains several previously puzzling features of our universe, such as its impressive uniformity. In principle, the properties of an “inflationary universe” might be used to calculate any deviations from uniformity of the distribution of matter and energy in the early universe, and predict the fluctuations in density out of which galaxies and other large-scale structures formed. These calculations would provide a critical test of such inflationary theories, as well as of the underlying theories of elementary particles.

Smithsonian Environmental Research Center

Basic scientific research aimed at understanding the processes occurring in the environment and their influence on biological systems and organisms is the principal activity of the Smithsonian Environmental Research Center.

SERC has two principal facilities: a 50,000-square-foot laboratory at Rockville, Maryland, and 2,600 acres of land with a small laboratory and support buildings at Edgewater, Maryland.

SERC also maintains an educational program that includes graduate students, postdoctoral fellows, undergraduate work/learn students, and public educational activities. The public education aspects emphasize teacher- and docent-led tours and activities. Docents guide adult and family groups on a two-mile Discovery Trail through outdoor research areas. A pamphlet keyed to signs on the Discovery Trail makes the walk self-guiding for visitors who are not on a scheduled tour. A recently developed soundtrack slide show describes the research at both Rockville and Edgewater.

Regular scientific seminars were held at both Edgewater and Rockville in fiscal year 1986. This ongoing educational activity informs the interested public about research activities and informs SERC staff about the work of colleagues in universities and other governmental laboratories. In addition, a scientific workshop was held at Edgewater on landscape ecology. Research is done by staff scientists who represent diverse disciplines, including biology, chemistry, physics, mathematics, and engineering, within the framework of regulatory biology and environmental biology.

The Environmental Research Center in Rockville closed on November 22, 1986. This laboratory began fifty-seven years ago with the mandate by Secretary Charles G. Abbot to study the influence of sunlight on growth and development of biological organisms. Research at the Edgewater location will continue.

The laboratory activities at Rockville began as a part of the Smithsonian Astrophysical Observatory and was an extension of Dr. Abbot's interests in measuring solar radiation. The laboratory staff produced some of the first measurements of seed germination, phototropism, and a series of other plant responses to light, establishing the laboratory as one of the leading photobiological and biophysical laboratories in the world.

Instruments were developed and measurements made of solar radiation that strikes the Earth. The laboratory obtained the longest continuous data base of solar constant measurements, daily measurements of the quality and quantity of sunlight at three-minute intervals for

many consecutive years, and measurements of ultraviolet radiation under widely varying geographical locations and weather conditions.

The objective has been to learn how sunlight regulates growth and development under natural conditions. From action spectra of photomorphogenesis for a wide range of biological responses—such as stem elongation, leaf expansion, hook opening of bean hypocotyls, flower induction and pigment synthesis of chlorophylls, anthocyanins, and carotenoids—it was demonstrated that the red far-red reversible pigment, phytochrome, is involved as well as an uncharacterized blue light absorbing pigment.

As physiological responses were measured, biochemical, genetic, and structural experiments were carried out. Biochemical purification and characterization of phytochrome were achieved; the interplay between the genetics of nuclei, chloroplasts, and mitochondria have been described extensively; and the role of accessory pigments in algae determined. The identity and structural arrangement of these accessory pigments within the phycobilisomes have been achieved. And the basic processes of flowering, gas exchange, and water relations have been studied extensively. Finally, the sensory pathways of stimulus response systems in fungi have been characterized biophysically, and biochemical genetics for the initial processes of biosynthesis of carotenoids have been published.

The carbon dating laboratory has provided carbon-14 dates of age for thousands of specimens. Among the laboratory's principal accomplishments has been the publication of more than 500 basic research papers and several books and the training of more than sixty pre- and post-doctoral students. The laboratory was an internationally renowned center for photobiology.

Activities at Rockville

Regulatory Biology

The light environment in which plants exist greatly affects their growth and development. It has been difficult to separate the effects of changing light quantity from the changes in the light quality. Efforts have been directed toward understanding the effect of light intensity on the growth and development of "shade loving" single-celled organisms under laboratory conditions. A better understanding was sought of how related multicellular organisms (red algae) can acclimate to changing

light conditions in their natural environment. Red algae generally grow under low light conditions in nature, which led to the assumption that they are thriving under the most favorable conditions and that special light-harvesting pigments (phycobiliproteins) are mainly involved in the acclimation to these conditions. The results obtained indicate that when cells grow best these special pigments are reduced and the photosynthetic rate of the organism is higher. These findings suggest that the size of the light gathering apparatus is not an accurate indicator of the photosynthetic capacity but rather that other factors are more important in light energy utilization. One of these is probably the turnover rate of the photosynthetic reaction centers.

Chloroplasts are the subcellular structures within cells of green plants in which photosynthesis takes place. Chloroplasts are composed of membrane and nonmembrane phases. An important constituent of these membranes, necessary for green plant photosynthesis, is CC I (core complex I). It consists of protein, chlorophyll, carotenoids, possible galactolipids, iron, and copper. The biosynthesis of the protein components of CC I and its structure are being studied in developing leaves of spinach to understand membrane growth by studying how proteins (polypeptides) of CC I are synthesized and added to the photosynthetic membranes.

It was found that the principal polypeptides of CC I (64,000 and 56,000 daltons—apparent molecular mass) are synthesized by the portions of the protein synthesis machinery of the chloroplasts—the ribosomes—attached to the chloroplast photosynthetic membranes. More than 95 percent of the messenger ribonucleic acid which codes for these polypeptides is associated with ribosomes attached to the chloroplast membranes. Also, isolated chloroplast membranes synthesize these polypeptides. Thus, the portion of the chloroplast protein synthesis apparatus bound to membranes is important in synthesis of constituent polypeptides of CC I and may be important in synthesis of other polypeptide constituents of the membrane.

Spinach and corn chloroplast deoxyribonucleic acids contain two closely spaced homologous genes for CC I polypeptides. Both genes have been shown to be expressed in corn. The results are that corn CC I gene 1 product corresponds to the spinach polypeptide of 56,000 dalton, and that it is likely that corn CC I gene 2 corresponds to the 64,000 dalton polypeptide of spinach. Spinach CC I was isolated from spinach chloroplast membranes. It contained 64,000 and 56,000 dalton polypeptides. An antibody to CC I reacted to both poly-

peptides. In contrast an antibody to a synthetic peptide from corn gene 1 reacted only with the spinach 56,000 dalton polypeptide. The amino acid sequence of corn gene 1 polypeptide was also present in spinach gene 1 and in the same position of the molecule as in corn. Thus, the 56,000 dalton polypeptide of spinach CC I corresponds to the polypeptide coded for by corn CC I gene 1. It is likely that spinach 64,000 dalton polypeptide corresponds to the product of corn CC I gene 2.

Light also regulates the formation of pigments in fungi. Phytoene, a 40-carbon colorless compound, is a precursor of the carotenoid pigments, and is synthesized from a 5-carbon compound, isopentenyl pyrophosphate (IPP), by a series of reactions. This biosynthetic pathway has been examined in the fungus *Neurospora crassa* using cell-free enzyme extracts. The conversion of IPP to phytoene requires both soluble and membrane-bound enzymes. The enzyme which converts geranylgeranyl pyrophosphate (GGPP) to phytoene was found to be membrane-bound and regulated by blue light. This enzyme is absent in an *albino-2* mutant. The conversion of IPP to GGPP requires two soluble enzymes, an isomerase and a prenyltransferase. The latter enzyme is regulated by blue light and is present at a reduced level in an *albino-3* mutant. Procedures are being developed to purify this prenyltransferase, as well as a similar enzyme which catalyzes the formation of farnesyl pyrophosphate, a precursor of steroids.

A serological examination of the distributions of organelles of single-celled sporangiophores of the fungus *Phycomyces* was completed using transmission electron microscopy of the tips of young stage one sporangiophores grown in vertical or horizontal photogeotropic equilibria. No observable differences could be found that correlate with demonstrable geotropic sensitivities of these cells. The data support the hypothesis that displacement of the large central vacuole serves as the gravireceptor sensitivity in this organism. This work was carried out collaboratively at the University of Zurich, Switzerland.

Finally, a collaborative project with Leonid Fukshansky and Alfred Steinhardt of the University of Freiburg in Germany was completed in which the optical parameters of mature stage four sporangiophores of *Phycomyces* were measured, and detailed light profiles within the cell generated mathematically by means of the large Freiburg computer. For these biophysical calculations the index of refraction of individual cellular components, as well as transmission and absorption properties, were measured. Correlations were made between these calculated profiles

and experimentally determined phototropic sensitivities. Good agreement was obtained between predicted values and observed responses.

Environmental Biology

A two-year study of the flowering behavior in three species of bamboo in Puerto Rico has been completed. The results show that buds are released from dormancy twice during the year at the onset of each rain season. Flowering occurs once during the year in the dry season (December to January). Plant growth regulators (hormones)—applied as foliar sprays, as a lanolin paste directly on dormant buds, or as an injection into the internode of the stem—had no effect on the timing of this flowering. These species flower once every forty to seventy-five years and then die; further experiments will be conducted with other species.

Last year it was reported that photosynthesis of the coastal halophyte *Spartina alterniflora* acclimated to salt concentrations of one and one-half times the salinity of sea water. Rates in acclimated plants were nearly equal to those of plants exposed to salinity less than one-third that of sea water. Plants grown at low salinity but exposed transiently over a few days to high salinity were severely impaired in all aspects of photosynthesis that could be determined by gas exchange measurements on whole leaves. This acclimation has been characterized this year by examining metabolic processes involved in its expression. It appears that a lesion in the photosynthetic apparatus results from impaired enzymes in the C₄ carboxylation pathway responsible for the assimilation of CO₂. Enzyme extracts of phosphoenolpyruvate carboxylase in different conditions of salinity and nitrogen exhibited changes in enzyme activity that correlated well with whole plant carboxylation efficiency. If these results are translated to the field situation they explain how plants in salt marsh environments are affected by increasing concentrations of salt and explain why some species, namely those having the C₄ pathway, do better than those with only the C₃ pathway. C₄ plants seem to have a higher efficiency to utilize incorporated nitrogen. Nitrogen is believed to be a limiting factor for growth and production of salt marsh vegetation. Increasing salinity appears to interfere with nitrogen metabolism, so plants having the ability to acclimate to this condition use nitrogen more efficiently and are more successful in surviving salt stress.

The solar monitoring program at Rockville, Maryland, and Mauna Loa, Hawaii, has collected data on the changes in atmospheric ozone and biologically active ultraviolet light. Although the visible region of daylight continues to show trends due to local environmental effects, the invisible ultraviolet light shows distinctly different trends. There have been significant changes in the amount of ultraviolet light that has reached the surface of the earth.

The Rockville data clearly show a long-term trend of decreasing ozone since 1976 and a definite increase in biologically active ultraviolet light. The invisible ultraviolet region of daylight is a major cause of cataracts and skin cancer. In the upper atmosphere, the ultraviolet light creates and destroys the ozone and heats the atmosphere. The long-term trend shows that a decrease in the amount of biologically active ultraviolet light now is beginning. The time of beginning was not known exactly, because terrestrial effects follow sunspot activity by two to two and one-half years.

Short-term activity of the sun has also been detected. In February 1986 a large drop in the biologically active region of ultraviolet light was observed. The amount of decrease became larger as the wavelength became smaller indicating a concomitant rise in the ozone should have taken place. A calculation from the data showed an ozone increase of significant proportions, but it was not large enough to account for the total drop in energy. A comparison between the computed values and those from the standard ozone measuring device at Mauna Loa showed the computed variations to be correct. A later comparison with the Earth Radiation Budget data from *Nimbus 7* showed the same loss of energy being measured in space. It appears to be a broad band loss in the ultraviolet light output from the Sun. It is significant that the solar monitoring program detected the loss at the same time the satellite did, rather than years later.

Radiocarbon Dating

The laboratory completed 300 service dates for the year, and the measuring equipment was shut down in mid-July. The counters, shielding, and gas preparative trains were loaned to the University of Pittsburgh, where Dr. Stuckenrath has been appointed research professor of anthropology.

Activities at Edgewater

Systems Analysis of Nutrient Flux

Overenrichment of Chesapeake Bay with nitrogen and phosphorus has been recognized as a major regional problem. SERC staff have examined this problem from an over-all landscape perspective by constructing a systems analysis based on the results of a series of more restricted studies. The annual movements of nitrogen and phosphorus were measured at automated sampling stations and arrays of surface and groundwater sampling collectors. Croplands discharged far more nutrient per acre than did pastures or forests. Most of the phosphorus was discharged as suspended sediment in overland flows during major storms while most of the nitrogen was discharged as nitrate in groundwater year-round between storms. Most of the nitrogen and much of the phosphorus released by croplands were absorbed by riparian forests along primary streams before the nutrients reached these channels. However, nutrient discharges from these primary streams still exceeded discharges from primary streams which drained pastures or forests. A freshwater forested swamp, through which most of the watershed drained, also trapped significant amounts of nutrients, especially phosphorus during major storms. The ratio of nitrogen to phosphorus in all watershed drainage was so low that nitrogen rather than phosphorus might limit algal growth in the estuary. Tidal estuarine headwater shallows were also a major trap for phosphorus due to settling of suspended sediments. Of the total nitrogen inputs to the landscape, 31 percent was from precipitation and 69 percent was from farm management. Forty-six percent of the total nitrogen input was removed as farm products, 53 percent either accumulated in the system or was lost in gaseous forms, and 1 percent entered the Rhode River. Of the total phosphorus inputs to the landscape, 7 percent was from precipitation and 93 percent was from farming. Forty-five percent of the total phosphorus input was removed as farm products, 48 percent accumulated in the system, and 7 percent entered the Rhode River. The tidal Rhode River, which has no point sources of nutrients, is seriously overenriched. Therefore, from this landscape perspective, improved Chesapeake Bay watershed management must strive to further reduce these seemingly low nutrient releases.

Sediment Flux

Sediment dynamics of the Rhode River watershed and estuary were summarized for a period of seven years. Sediment inputs to the estuary occurred primarily during a few major storms. These storms delivered soil particles eroded during these major storms and much of the sediments eroded by smaller storms. Most of the sediments delivered by major storms are deposited in open water areas in the headwaters within two or three days. Some of these sediments were then slowly moved further down the estuarine basin by tidal mixing processes which occur continuously. Sediment dynamic data and historical records indicate tidal marshes account for only 13 percent of sediment trapping, although they occupy 60 percent of the estuarine study area.

White Cedar Wetlands

Atlantic White Cedar wetlands are widely distributed along the Atlantic coast yet there is very little information on their structure and function. A study of one of the last remaining White Cedar stands on the inner coastal plain of Maryland compared its vegetation patterns, soils, and vegetational nutrient status with other nearby wetlands and a White Cedar site in Virginia. The White Cedar wetland had high soil calcium and magnesium and low soil phosphorus content. Tree tissue composition indicated phosphorus and possibly potassium and nitrogen deficiencies, as well as high tissue content of aluminum. The abundance and distribution patterns of thirty-two species of higher plants were recorded at this White Cedar site.

Spawning Cycles in Mummichog

In the tidal Rhode River, large populations of mummichog (*Fundulus heteroclitus*) live along tidal creek shorelines and move up onto the marsh surfaces to feed during high tides. Along the east coast of North America, mummichogs move up onto the surface of salt marshes during high spring tides to spawn and have been shown to have semilunar spawning cycles. In the Chesapeake Bay, where tidal changes frequently and unpredictably override lunar tidal levels, it was found that mummichogs still had semilunar reproductive cycles which lagged the new and full moons by three to four days.

Smithsonian Institution Archives

These results indicate that the fish act on something other than tidally mediated factors, such as turbulence, salinity, or temperature.

Invertebrate Populations in the Estuary

Animal population results were integrated and evaluated from the first six years of a long-term study in the tidal Rhode River. Population abundances for invertebrates living in sandy or muddy bottom sediments were monitored; near-shore fish were sampled for young-of-the-year populations, and bottom-dwelling fish and crabs were trawled for by a standardized procedure each year. Population data were compared to physical/chemical water quality and weather variables monitored continuously at the site for sixteen years, to test for patterns and relationships. The study period spanned a multiyear period of regional drought which resulted in markedly increased salinities. All but two of forty-two species underwent significant changes in population densities among years. However, only 12 to 82 percent of the population changes could be explained on the basis of salinity changes with a statistical model.

Still under exploration are relationships to such other factors as phytoplankton densities, suspended sediment concentrations, and dissolved oxygen dynamics which have also been measured continuously. Vertical distributions of invertebrates in sandy and muddy bottom sediments were also measured in detail at a series of locales. Polychaete worms, amphipods, and young clams did not move more than two inches into the sediments, whereas large clams moved as deep as one foot and were restricted to sandy sediments. Studies of the feeding of adult blue crabs on adult soft-shelled clams indicated that these clams can only persist by burrowing deep in sandy sediments. In controlled experiments it was shown that crab predation was significantly higher in mud than sand. Blue crabs displayed prey density-dependent feeding in sand, but not in mud. Thus, clams hiding in mud are essentially quantitatively harvested by blue crabs, but after the crabs have removed part of the population in sand they cannot find enough clams to be worthwhile.

The Smithsonian Institution Archives (SIA) is the central archives of the Institution, keeper of its official records, and collector of supplementary documentation on the history of its activities. The Archives was organized in its present form in 1967, and its holdings are of great value to scholars working on the history of American science and culture.

This past year was highlighted by an SIA reception and exhibition celebrating the 100th anniversary of the birth of Alexander Wetmore, sixth Secretary of the Smithsonian Institution. The exhibition, *Alexander Wetmore: The Early Years, 1900-1925*, drew on documents and photographs from Wetmore papers in the Archives to depict his early fieldwork in ornithology. Silent film footage of Wetmore's Panama expeditions in the 1950s was copied onto videotape, coupled with narration prepared by the Archives historian and the late Watson M. Perrygo, Wetmore's colleague on the expeditions. The tape was shown to those attending the centennial celebration and has been made available to other audiences.

A similar project, film footage of the 1941 Smithsonian-Firestone Expedition to Liberia, with narrative by Lucile Mann on videotape, was shown to a number of audiences during the year, and copies were made available to the U.S. Information Center in Monrovia.

The Archives will be home to a major new source of historical documentation on videotape. A grant awarded to the Smithsonian Institution by the Alfred P. Sloan Foundation will support videotaping of interviews about "Science in National Life." The Archivist serves on the project advisory committee, which is headed by David DeVorkin of the National Air and Space Museum (NASM). Two projects relating to species conservation and to challenges to evolutionary theory will be conducted by the SIA oral history staff. Other projects will be undertaken by curators in NASM and the National Museum of American History.

The Archives participated, through research and loans of materials, in the development and execution of the major Smithsonian Institution exhibition *Magnificent Voyagers: The U.S. Exploring Expedition, 1838-1842*. Loans were also made to the Cosmos Club for an exhibition on Alexander Wetmore, to the Folger Shakespeare

The Smithsonian Institution Archives recently received a large collection of photographs of entomologists. In this photograph, circa 1888, entomologists—at what was then called the U.S. National Museum—Eugene A. Schwarz (*left*) and John Bernard Smith are shown at rest on a field trip.



Library for an exhibition on Emily Dickinson, and to NASM for the *Looking at Earth* exhibition.

During 1985 the Archives staff played an important role in activities concerning both archives and museum archives. The deputy archivist led a consortium of museums—the Field Museum of Natural History in Chicago, the American Museum of Natural History in New York, the Natural History Museum of Los Angeles County, the California Academy of Sciences, and the Academy of Natural Sciences of Philadelphia—in its efforts to establish common archival practices. He was also named North American Representative of the Society for the History of Natural History. The associate archivist organized the Museum Archives Roundtable of the Society of American Archivists for the sharing of information and experiences of museum archivists. Other members of the staff provided advice to a number of museums and archives on the management of photographic collections and on oral history techniques. The Archivist conducted a tour of archives in the People's Republic of China for three dozen representatives of the Society of American Archivists. The SIA regular lecture series on Research in Progress included talks on the first Smithsonian photographer, Thomas W. Smillie, by David Haberstick of the National Museum of American History, and on Black artist W. H. Johnson by Smithsonian Fellow Richard J. Powell. The opening of *Magnificent Voyagers* was the occasion for a lecture by Colorado College professor Richard Beidleman, who retraced the Wilkes party movements in Australia. Ellen B. Wells of the Smithsonian Institution Libraries spoke on the popular natural history books of Reverend J. G. Powell.

Also this year, the Archives published *Guide to the Field Reports of the United States Fish and Wildlife Service, circa 1860–1961*, the fourth volume in its guides to collections series.

Nearly 1,500 reference inquiries were answered this year by SIA staff. Publications during the year that relied in part upon research at SIA included "Disloyalty, Dismissal, and a Deal: The Development of the National Museum at the Smithsonian Institution, 1846–1855," by Joel J. Orosz, in *Museum Studies Journal* 2 (1986), and *Captured Heritage: The Scramble for Northwest Coast Artifacts* (Seattle and London: University of Washington Press, 1985) by Douglas Cole. Elizabeth Barnaby Keeney completed a Ph.D. dissertation entitled *The Botanizers: Amateur Scientists in Nineteenth-Century America* (University of Wisconsin-Madison, 1985); and Paul Russell Cutright was the author of *Theodore Roosevelt: The Making of a Conservationist* (Urbana and Chicago:

University of Illinois Press, 1985). Research still in progress includes a biographical study of ornithologist Charles E. Bendire, a history of paleontology at the Smithsonian, and a biography of Charles D. Walcott, fourth Secretary of the Institution.

Records survey work in the past year was highlighted by a major survey of the records of the Freer Gallery of Art, and continuation of surveys and follow-up surveys at the Smithsonian Astrophysical Observatory, the National Zoological Park, the Smithsonian Environmental Research Center, the Anacostia Neighborhood Museum, the Archives of American Art, the National Museum of American Art, the National Museum of Natural History, and the National Museum of American History.

Manuscript collections accessioned this year included the papers of entomologist Curtis N. Sabrosky and invertebrate zoologist Raymond B. Manning. The American Association for Zoological Nomenclature and The Crustacean Society entered into agreements with the Smithsonian Archives for SIA to be the official repository of their records, joining more than a score of professional societies which have now so designated the Smithsonian Institution Archives. A set of guidelines on records retention and disposal has been developed for such societies.

Oral history interviewing continued and new acquisitions during the year brought the collection total to 270 hours of recorded audiotape and nearly 5,000 pages of transcript.

The SIA survey of photographic collections in the Smithsonian Institution made great strides in the past year, completing survey work in the National Zoological Park, the Hirshhorn Museum and Sculpture Garden, the Freer Gallery of Art, the National Museum of African Art, the Office of Printing and Photographic Services, the Smithsonian Astrophysical Observatory, and the Smithsonian Tropical Research Institute. Work was begun in the National Museum of Natural History and the Archives of American Art; and drafting of the first of a series of finders' guides (for the National Museum of American History) was substantially completed. Publication of the latter is scheduled for the fall of 1987, and it will include an extensive glossary of photographic terminology. The photographic collections survey project is becoming a national model.

Smithsonian Institution Libraries

Smithsonian Institution Libraries (SIL) continued to serve the Institution and the public through support of Smithsonian curatorial, research, and other program activities; through direct participation in the creation of and providing ready access to a national bibliographic data base; and through programs for loan and information services, publications, and exhibitions. The SIL, a member of the Association of Research Libraries, is divided into three operational divisions (Automated Systems, Research Services, and Collections Management) and a Planning and Administration Office.

The collections of approximately 980,000 volumes, including over 20,000 journal titles, are available to Smithsonian staff and other scholars through a system of fourteen branch libraries spread over thirty-five locations throughout the Washington, D.C., area; New York City; Cambridge, Massachusetts; Mount Hopkins, Arizona; and the Republic of Panama.

The Libraries' budget represents 2.5 percent of Smithsonian federal expenditures, exclusive of trust and auxiliary enterprises. During fiscal year 1986 the Libraries received three grants totaling \$25,000 from the Atherton Seidell Endowment Fund and a fourth for \$3,000 from the Women's Committee of the Smithsonian Associates. Personnel resources were reinforced through an increased number of stay-in-school employees working in central services and branch libraries, interns serving in four units, and through the dedicated service of sixty-seven volunteers who assisted in all units of the Libraries.

Vija Karklins was named the first SIL deputy director, and in June it was announced that David Challinor, Assistant Secretary for Research, is the SIL liaison for administrative and programmatic matters, with Tom Freudenheim, Assistant Secretary for Museums, providing counsel on museum-related matters. The opening of a renovated Central Reference and Loan Services branch and the physical consolidation of all central services, with new quarters for the Acquisitions Unit and Supply Services, were accomplished in October and January, respectively. Planning progressed for the opening of the Museum of African Art branch in the Quadrangle; the design for the renovation of the main location of the Natural History branch was completed; and installation of uniform signs in all SIL units was started this year.

Automated Systems Division

The division continued to extend and upgrade the integrated on-line library system of the Smithsonian Institu-



Smithsonian Institution Libraries Director Robert Maloy presented a copy of the *Manuscripts of the Dibner Collection* (SIL Research Guide No. 5) to Dr. and Mrs. Bern Dibner at a reception held in the Dibner Library at the National Museum of American History in October 1985.

tion Bibliographic Information System (SIBIS) by implementing new modules for additional functions and services. An important development in this process was the installation of the Geac 9000 computer which supports a greatly improved bibliographic processing system with capabilities for Boolean searching, authority control, and automated management of bibliographic headings—such as personal and corporate authors and subject index terms. The system also has a capability to produce management information reports. More people are using the system, with access by both dedicated terminals and personal computers. These devices are linked to the computer by hard wire or dedicated data lines, or through dial-up lines from as far away as Panama. Through a concentrated program of retrospective conversion of old manual records, the SIL data base has grown to over 325,000 records. Work has started on the last phase of the conversion program which will convert and add the old, incomplete, manual records to the data base. Upon completion, the index to the older SIL collections will be improved and the assignment of call numbers will permit the physical integration of previously unclassified books into the collections.

As the Acquisitions Services unit completed its second successful year using the SIBIS acquisitions system for orders and payments, planning began for implementation of the serials check-in module. SIL books are now being barcoded in preparation for implementation of the on-line circulation system. Inroads have been made into cataloguing/inventory backlogs by use of the on-line sys-

tem, contract work, and the hiring of a second rare-book cataloguer. Special attention has been given to the production of specialized bibliographies. The African Art and Smithsonian Tropical Research Institute bibliographies were the first to be added to the SIL data base. Indexing of trade literature continued, and 35,000 trade catalogue records are now a part of the data base.

Research Services Division

The division continued to stress more effective delivery of information to users as its primary goal. Within a few weeks of the implementation of a contract for commercial document delivery service, interlibrary loan backlogs were cleared in all branches. Subsequently, it has been possible to dispatch requests within twenty-four hours. The larger branches were assigned responsibility for most interlibrary borrowing in order to integrate that function more fully into over-all reference services. Efforts were also made to regularize relations with the Library of Congress and to conform to its restrictions on loan periods. As a result, hundreds of overdue Library of Congress books were returned by borrowers, and by the end of the fiscal year all outstanding loans had been cleared. Another focus of activity was the further systematization of procedures, forms, and standards. Managers of the four organizational units met monthly throughout the year in consultation with the division assistant director to address operational issues. As a result, the division functions more smoothly and with greater consistency across branches than ever before. This improvement has also been aided by full staffing in the division for the first time in four years.

Collections Management Division

The division is responsible for selecting and ordering research materials for the branches, maintaining and preserving the SIL collections, and ordering books for offices throughout the Institution. Collection development policies for each of the branches are nearing completion. The African Art branch continued retrospective purchasing to enhance SIL's Africana collections. Since 1985, the branch collection has doubled in size to more than 10,000 volumes, with special emphasis on travel and exploration, early ethnographies, African imprints, and specialized serials. Of special note was the purchase of Charles Guillain's three-volume *Documents sur l'His-*

toire, la Geographie et le Commerce de l'Afrique Orientale (1856), with accompanying folio atlas containing original engravings.

Other notable additions to the Libraries' research collections were a gift to the Cooper-Hewitt Museum branch of 400 pop-up books dating over the past century; a collection of nineteenth-century farmers' and country almanacs; books on physical anthropology from the estate of Professor Carleton S. Coon; and an exceedingly rare 1611 pamphlet by Johannes Kepler, a purchase made possible by the Dibner Fund. Staff of the Book Conservation Laboratory made two important discoveries. In preparing a Charles Darwin manuscript for use in filming an episode of the television series, Smithsonian World, laboratory staff removed the cardboard backing to discover handwriting on the back of the page. Identification of the author is still under investigation. Then, during the restoration of a rare eighteenth-century volume printed in Spain, laboratory staff discovered two complete copies of a 1763 pamphlet containing a laudatory poem used to stiffen the book's two vellum covers.

The final report of the SIL Preservation Planning Program, in which twenty-five staff members participated, contained thirty-seven recommendations for enhancements to current preservation efforts. One of the task force reports revealed that the most pervasive preservation problem is severe brittleness, affecting 30 percent of the books in the survey. In late 1985, a selection of brittle volumes from the botany collection were microfilmed by a contractor. A second significant report, compiled by an SIL working group that included participants from three other Smithsonian units, reviewed the current status of optical digital disk technology and its applications to preservation. The report included specifications for an SIL pilot project, but recommended postponing action until more information on the success of other projects is available.

Public Programs

On November 14, SIL and the Society for the History of Natural History (headquartered at the British Museum, Natural History, London) cosponsored the annual Ramsbottom Lecture featuring Joseph Ewan, Professor Emeritus of Botany at Tulane University, who spoke on American naturalists of the Andes and the Amazon. The lecture was presented in conjunction with the opening of *Magnificent Voyagers: The U.S. Exploring Expedition 1838-1842*, the National Museum of Natural History

Smithsonian Tropical Research Institute

exhibition. Other outreach activities included two events in the SIL Lectures and Seminars Series—a seminar discussing a fourteenth-century manuscript containing text of the Pentateuch, conducted by Allen Crown of the University of Sydney, Australia, on May 16; and a lecture featuring James M. Robinson, director of the Claremont Institute for Antiquity and Christianity, who spoke on “Reconstructing the First Christian Monastic Library” on September 15. Dr. and Mrs. Bern Dibner were among the distinguished guests who attended an October 1985 reception to mark the publication of *Manuscripts of the Dibner Collection* (SIL Research Guide No. 5) where Dr. Dibner was presented with the first copy of the publication. The event also celebrated the opening of an SIL exhibition of the same name. Another SIL exhibition, *The Old Farmer's Almanac*, displayed materials donated by Yankee Publishing Company. This gift of a complete 194-year run of the almanac from its first issue in 1792 was also marked by a press conference in the Dibner Library. Other exhibitions were *Science and Technology in Latin American History*, *Classics of Mathematics*, and *The Excellent Mr. (John) Ray*.

SIL was awarded \$100,000 equivalent in Pakistani rupees by the Smithsonian Foreign Currency Program to fund part of its continuing Translation Publishing Program, and an Institution contract with a Pakistani publishing house was signed in November. Six orders for new translated publications were placed with an Indian publishing house, and the production schedules for twenty-eight orders placed under the old contract were established at meetings with the contractors and other U.S. government agencies with similar translation programs. *Nematodes and Their Role in the Meiobenthos* was published by the program this year, and the texts of ten translations were received for scientific editing by scholars in the United States. The SIL Publications Program filled requests for 546 copies of *Book Collecting and the Care of Books*, an SIL publication.

SIL staff participated in a number of professional meetings and collectively published five books, twenty-one articles, and two reports. SIL welcomed the following visitors this year: the director of the National Library of Jamaica; professional librarians from the American Association of Law Librarians; the Costa Rica Library Association; the University of Tennessee, Knoxville; the Biological Sciences Group of the Special Libraries Association; a group of thirty professionals from other countries organized by the Academy for Educational Development; graduate library students from four universities; and the Washington Book Conservators Group.

The sheer diversity of the tropics widens the perspective on possible outcomes of evolution and vastly multiplies the scope for comparison which plays a fundamental role in achieving biological understanding. Because tropical conditions have been normal for most of evolutionary time, understanding the tropics enables scientists to see the temperate zone in a truer light.

The Smithsonian Tropical Research Institute (STRI) promotes basic research in the tropics by its staff, students studying in association with the staff, and visiting international scientists. As tropical nature is severely threatened from many quarters, STRI promotes conservation and education.

STRI offers the student of tropical forests the Barro Colorado Nature Monument, centered on Barro Colorado Island, which has been protected since 1923. This island is within two hours of Panama City and has well-equipped laboratories, offices, and living quarters. The advantage of this island is the sixty years of previous research, of unparalleled detail and extent, on which the newcomer can build. STRI also offers the terrestrial biologist access to a variety of habitats. Through marine laboratories on both coasts, STRI allows marine biologists an opportunity to compare oceans only fifty miles apart, which differ greatly in tidal regime, productivity, and exposure to upwelling. The populations in these oceans were separated less than four million years ago, offering a natural experiment in evolution.

STRI maintains the largest library of tropical ecology between Mexico City and Caracas, a variety of laboratories, offices, apartments, personnel who can help one cope with working in a different country, and programs of assistantships for beginning students and fellowships lasting from one to twelve months for more advanced students. In addition, many STRI staff work in Asian and African tropics to obtain comparative data.

Diversity of Adaptations

Predoctoral fellow Jess Zimmermann has been studying an orchid which changes sex. He seeks to infer the circumstances which cause an orchid to change sex from the influence of the environment on the sex of an orchid. He is also investigating how orchids in well-lit habitats divide their effort between reproduction and growth, and the limits to the orchids' power to produce fruit.

STRI senior scientist Martin Moynihan spent the first five months of this fiscal year in Senegal studying variations in sexual behavior in coraciiform birds, especially

kingfishers and rollers. The sexual behavior of most animals include components that were originally hostile. In at least three species of coraciiforms, the process is reversed: their threats include components that were originally sexual. Blue-bellied rollers use heterosexual pseudocopulation as threat displays; other species employ homosexual behavior in their threats. Yet other species reverse sex roles as a form of appeasement—males playing females before other males to appear as mates rather than threats.

STRI Director Ira Rubinoff is continuing studies of diving in sea snakes, *Pelamis platurus*. It appears these snakes “know” how deep they will dive and take on enough gas to be neutrally buoyant at the intended depth. Working with Jack Gee, Jeffrey Graham, and Jorge Motta, Rubinoff found snakes new to a deep tank take on so much gas that they are positively buoyant at the bottom, while snakes familiar with the tank take on just enough to be neutrally buoyant at the bottom. Further studies of buoyancy mechanisms in snakes are in progress.

Such studies of adaptation often bring out intricacies of relationships between species in tropical forests. Donald Windsor, of STRI, has been studying leaf miners of the tree *Byrsonima crassifolia* (Malphiaceae). These leaf miners go to great lengths to hide their mines, mining the oldest leaves of the tree—the hardest to see from a distance. Yet, mined tissues turn black against the light green background of the remaining leaf. Windsor is trying to learn whether this color change attracts parasitoids which kill the leaf miners.

Neal Smith, of STRI, returned to his studies of oropendolas, caciques, and their associated wasps, botflies, and parasitic cowbirds. Oropendolas lay eggs in each other's nests. R. Fleischer of the University of Hawaii is helping Smith with analyses of eggshell proteins that allow Smith to identify who laid the eggs that a given bird is incubating. Nearby wasp colonies protect oropendola nestlings from botfly attacks, and in oropendola colonies surrounding such wasps nests, female oropendolas often toss each other's eggs out of the nests nearest to the wasps. Experiments with introduced wasp nests inhabited only by dead, pinned specimens suggest that oropendolas must be stung before deciding that a wasp nest is a desirable neighborhood for nests of their own.

In cooperation with Jonathan Horn of Kew Gardens, Smith began chemical analyses of *Omphalea*—the Euphorbiaceous vine fed upon by larvae of the *Uranina* moth—and found several nonprotein amino acids. Smith confirmed that *Omphalea* vines which *Uranina* caterpillars

have defoliated four successive times become unacceptable to *Uranina* for the following three years. During this period the vines have healthy foliage but produce no flowers.

Biotic Diversity

The fifty-hectare plot of Stephen Hubbell and Robin Foster, both of STRI, on Barro Colorado Island was re-censused after five years. Changes in the plot over this period confirm the inferences Hubbell and Foster drew about the dynamics of the forest by comparing the distributions of adult trees with saplings of the same species. Saplings of the two most common overstory species, *Trichilia* and *Alseis*, grow more slowly and die more rapidly where adults of their species are most common. For most other species, survival and growth of saplings diminish almost imperceptibly by the presence of a conspecific. Rare species regenerate no more effectively than common ones, a fact which appears to belie several popular explanations of tropical species diversity. The plot is still in a stage of succession, with common species increasing at the expense of those of intermediate abundance. The abundance of some species changed markedly over the past five years; 40 percent of the *Poulsenia* on the plot died, probably from the harsh El Niño dry season of 1982–83.

The remapping revealed a striking contrast in patterns of mortality between pioneer and mature forest trees. In species of mature forest, annual mortality is independent of size for stems greater than one centimeter in diameter. Pioneer trees, on the other hand, survive better when they get larger.

Alan Smith, of STRI, continued long-term studies of growth, distribution, and reproduction in understory forest herbs of Barro Colorado Island. Forest plots ranging from 100 square meters to 10 square kilometers appear to contain no more species of understory herbs in the tropics than in temperate zones. Perhaps study of a group that does not share the explosive diversification of the tropics will help STRI scientists to understand the causes of this diversification.

Peter Becker and Alan Smith have been working together on a method to analyze canopy photographs to

Dr. Juan Laboa of the Diplomatic Corps of Panama visited Barro Colorado Island on August 6, 1986.



estimate direct and diffuse radiation reaching the understory and to assess whether direct light is divided into a few big sunflecks or many small ones. Canopy photography permits a quick analysis of many sites from this standpoint. On Barro Colorado Island, herbs are most diverse where there is most light. Because of the light received before trees overhead produce new leaves, understory herbs probably get more light in the temperate zone than in the tropics.

Seasonal Rhythms

T. Mitchell Aide, a STRI predoctoral fellow from the University of Utah, is studying how damage inflicted by herbivores on leaves of different species of saplings reflects the seasonal rhythms of leaf flush in saplings. *Hirtella triandra* produces new leaves continuously, in small amounts, from October through June. Damage by herbivores drops by one-half during the dry season. Herbivores build up as the rainy season starts, and *Hirtella* stops producing new leaves in June, starting again late in the rainy season when herbivore levels have subsided.

Gustavia produces new leaves at the end, and at the beginning, of the rainy season. Each leaf expands to full size in a week; most herbivore damage occurs before the leaf has expanded. Leaf production is more synchronous at the beginning of the rains. Presumably as a result, herbivores damage new leaves less at the beginning than at the end of the rains. Leaves produced "out of turn" during the rainy season are often destroyed before they can expand. Young *Gustavia* leaves are covered with food bodies that attract ants; these food bodies disappear after the leaf expands. Experiments are now in progress to learn how effectively the ants protect the expanding leaves.

Donald Windsor, of STRI, has been preparing a summary of results from eight years of monitoring seasonal changes in climate and other aspects of the physical environment on Barro Colorado Island.

Joseph Wright, of STRI, experimentally abolished one aspect of the seasonal rhythm in experimental plots on Barro Colorado Island. By irrigating them, he kept their soil moisture content at rainy season levels all through the dry season. Most deciduous trees on the irrigated plots dropped their leaves in synchrony with conspecifics outside, although *Tabebuia guayacan* and *Dipteryx* within the plot kept their leaves through the dry season, in contrast to their unirrigated conspecifics. Irrigation did not affect the timing or amount of litter fall, but it

accelerated the decay of litter. During the dry season, litter insects were more abundant on irrigated plots, as were tiny insects on understory leaves.

On the San Blas Islands, off the Caribbean coast of Panama, Ross Robertson, of STRI, has been studying the causes of seasonal rhythms of reproduction in coral reef fish. It is usually assumed that seasonal cessation of reproduction in these fish reflects the inability of their larvae to survive in the plankton at that season. He has been simultaneously measuring egg production, rates at which larval fish settle on the reef, and the ages of these settlers to determine the extent variation in rates of settlement reflects variation in previous reproductive rates. It appears that ability of larvae to survive in the plankton may not depend on the time of year and that these fish reproduce seasonally because they are unable to produce eggs at certain times of year.

John Cubit, Hugh Caffey, Don Windsor, and Ricardo Thompson have finished the analysis of eleven years of monitoring the physical environment on the reef flat at STRI's Caribbean marine station on Galeta Point. They found that when water on the reef flat is subject to extremes of temperature or salinity, the water can kill corals elsewhere when it moves off the flat.

A Major Oil Spill

In April 1986, a major oil spill occurred near Galeta. Enough oil reached Galeta to cause extensive mortality on the reef flat, and perhaps long-lasting damage to the mangroves behind the station. This is the first time an oil spill has occurred in so well studied a place, and the Department of the Interior expressed interest in following up the effects of this disaster.

Jeremy Jackson, of STRI, assumed responsibility for studying the consequences of the oil spill. This study will span a considerable stretch of the Caribbean coast and will build on previous work by many people at a variety of sites. The studies will trace where the oil has gone and where it is accumulating—and will assess subsequent changes in mangrove trees, the communities of organisms growing on mangrove roots, sea grasses, reef flats, and subtidal reefs. Judith Connor, of Hopkins Marine Station, has returned twice to study the effects of the oil spill on algae; and Stephen Garrity, of the University of Massachusetts, has returned once to study its effects on intertidal snails.

Although there have been no previous studies of subtidal reefs, a reef coral contains a record of its growth.

By drilling sections of reef corals, the effect of the oil spill on reef growth can be traced.

Long-term Community Dynamics

Much research has been concerned with long-term aspects of community dynamics. Jeremy Jackson, with Karl Kaufmann, is continuing his analysis of data from Jamaica on the dynamics of encrusting organisms living on the undersides of coral shelves. Jackson is working with T. P. Hughes on the dynamics of coral reef populations at Jamaica. Peter Glynn, a former STRI staff member now with the University of Miami, continues his study of how the massive mortality of reef corals in the eastern Pacific, inflicted by El Niño of 1982–83, affected development of the reefs. Haris Lessios, of STRI, is following the recovery of the long-spined sea urchin *Diadema* from the mass mortality that reduced their numbers by over 99 percent three years ago. Their numbers are still very low, but their genetic variability is as high as ever.

Genetics and Evolution

Haris Lessios, with James Weinberg, has found that what was once thought to be a single species of isopod, *Excitrolana brasiliensis*, living on both coasts of Panama, embraces one wide-ranging Atlantic species and a series of Pacific species. Each beach on the Pacific has its own species and genotype—one closely resembles the Atlantic species.

Lyn Loveless and Jim Hamrick, of the University of Georgia, have been studying isozyme variation in fifteen species of tropical trees. They have been comparing variation within populations on Barro Colorado Island—with variation among populations a few hundred meters apart and two kilometers apart—and variation between populations on that island and populations varying distances away on the mainland. Populations of *Suartzia* in Panama are quite similar, and, for the seven other species analyzed, genetic variation among populations on Barro Colorado Island is about 5 percent of variation within these populations.

Other STRI studies concern the origin and development of phenotypic novelty. In Costa Rica, William Eberhard, of STRI, has been studying the weaving of webs by spiders. The web is a physical record of what happened; moreover, many of the cues guiding the spider



A devastating oil spill near the Smithsonian Tropical Research Institute's Galeta laboratory in April 1986 coated reef, seagrass, and mangrove communities with a heavy layer of oil.

in its completion of the web come from the web itself. Spiders show variability in web building behavior from one web to another.

In his new book, *Sexual Selection and Animal Genitalia*, Eberhard explores why animal genitalia are so variable among species and why they evolve so rapidly. With Eberhard and W. Wcislo, Mary Jane West Eberhard, of STRI, has been studying the adjustment to group living by spider wasps belonging to a family of otherwise solitary animals. Their adaptation to new social circumstances is manifestly incomplete. They spend an inordinate amount of time stealing and eating each other's eggs. They sometimes steal their own provisions and allow other wasps to steal nest cells. The incompleteness of their adaptation may reveal how animal behavior might evolve in response to group living.

John Christy has been studying constraints on the evolution of mating and breeding behavior in fiddler crabs. Most Indo-Pacific species of fiddler crabs are large relatives to their American counterparts; and most Indo-Pacific fiddler crabs mate above ground near the burrows of the females, while most American species mate in the burrows of the males. Christy is analyzing the relation of mating system to crab size and clutch size. He is also studying *Uca beebei*; in this American

fiddler crab species, some females accept mates near their own burrows while others search for mates near the burrows of the males, sampling several before mating with one in his burrow. Perhaps understanding why different female *Uca beebei* mate in different ways will shed light on the sources of the different mating habits of American versus Indo-Pacific fiddler crabs.

Jeremy Jackson has finished a book with Frank McKinney on bryozoan evolution. He has started research with Anthony Coates, of George Washington University, on how the uplift of the Panama Isthmus affected the speciation and extinction of marine organisms—especially bryozoans, crabs, and molluscs—on its two sides. They are accordingly focusing on the geology and paleontology of Panama from the Pliocene age onward. The first task is stratigraphic dating of the faunas and establishing correlations between them. The U.S. Geological Survey will assist in dating these faunas, using microfossils, such as foraminifera and dinoflagellates, collected from them.

Evolutionary Convergence

STRI has long been interested in evolutionary convergence because it tells STRI scientists something about the predictability of evolution—allowing assessments of how representative findings in Panama are of the tropics in general.

Alan Smith returned to Mt. Kenya to continue his study of growth forms and long-term rhythms of growth, reproduction, and mortality of the alpine giant senecios there. He has comparable work in progress on the *Espeletia* (Compositae) of the high Andes in Venezuela. These senecios only flower about every five years, and plants of an entire mountaintop flower in tight synchrony. The senecios reproduced in 1985, so Smith started experiments on the factors influencing the germination and growth of seedlings—especially the effect of habitat type, of nearness to adult, and the difference in that adult's influence according to whether it is a parent, another adult of the same species, or an adult of different species. Being away from adults dramatically increases a seedling's growth.

Egbert Leigh went to Madagascar with Alison Jolly of Rockefeller University to continue his studies on the contrast in tree architecture, leaf size, form and arrangement, and forest physiognomy between lowland rainforest and forest of windy, foggy mountaintops. He documented the striking similarities between the mon-

tane forest on the volcanic soil of the Montagne d'Ambres in Madagascar and the montane forest on the volcanic soil of the Cordillera de Tilarán in Costa Rica. He also found that lowland rainforest in far southeast Madagascar had far less diversity of trees than mid-montane rainforest further north.

In cooperation with the Malaysian Forest Research Institute and Peter Ashton of Harvard University, Stephen Hubbell has begun mapping a fifty-hectare plot of tropical rainforest in a Malaysian forest reserve. In contrast to the 235,000 stems over 1 centimeter in diameter on the plot of Barro Colorado, the Malaysian plot will have over 350,000. When all the identifications are complete, the Malaysian plot may have over 700 species of freestanding woody plants, compared to 300 on the plot at Barro Colorado.

Man in the Tropics

Olga Linares, of STRI, spent five months among the Jola of Casamance in Senegal studying how the spread of Islam affected gender roles in agriculture. Before Islam, men and women participated equally in religious ritual and worked together in the same rice fields. After Islam, women grow only rice, the subsistence crop, and men grow groundnuts, the cash crop. Linares is working on drafts of two books on the Jola—one on the effects of the drought and the other on the social division of labor in agriculture.

A series of studies financed by the W. Alton Jones Foundation are devoted to altering the relation between man and nature in Panama. Nicholas Smythe and Dagmar Werner are trying to find ways for people to profit from the forest without destroying it. Smythe has raised pacas, the most desirable game animal in Panama, in a manner that prevents, apparently permanently, depression of population levels—a major step towards their domestication.

Gilberto Ocana has been studying ways to reclaim wasteland for agriculture and to farm using land more efficiently. He finds that a fast-growing hardwood from Southeast Asia, *Acacia mangium*, grows very well on poor soil. He has been testing annual and biennial legumes for their ability to improve poor soil and finds tropical kudzu, *Desmodium gyroides*, promising for the purpose. He has also experimented with crops which will grow with fast-growing leguminous trees. The crops provide food while the trees provide firewood and maintain soil fertility.

Education

STRI's newly consolidated Office of Educational Programs developed an audiovisual program on STRI's history and activities for presentation to groups of government officials and representatives of Panamanian conservation groups. In addition, a series of bimonthly newspaper articles have been prepared on conservation topics.

Bringing tropical nature alive in people's minds to stimulate interest in its fate is a growing activity. Marina Wong, a STRI postdoctoral fellow, and Jorge Ventocilla, of STRI's Office of Educational Programs, have completed the text and illustrations for a self-guiding nature trail for visitors on Barro Colorado Island. Egbert Leigh, of STRI, has arranged for artist George Angehr and Malagasy botanist M. Abraham, of the Service des Eaux et Forêts, to prepare an illustrated guide to the fifty most common species of trees in a forest reserve near Perinet between Tananarive and the east coast of Madagascar.

The Spanish translation of the Smithsonian Institution Press book, *The Ecology of a Tropical Forest*, is nearing completion. Publication of the Spanish edition of this important book will make knowledge developed as a result of STRI research programs more generally available in Panama and other Spanish-speaking nations. The Office of Educational Programs continues to work with the Kuna Wildland Management project on environmental education and conservation.

STRI and the University of Panama again jointly sponsored a graduate-level tropical ecology course focusing on relationships between plants, animals, and the physical environment in habitats throughout the Republic of Panama. Donald Windsor, of STRI, and Rosemary Segistran de Chavez, of the University of Panama, were course coordinators.

The Smithsonian Institution Traveling Exhibition Service exhibition *Galapagos: Born from the Sea* is touring Panama under cosponsorship of STRI and the National Institute of Culture. The exhibit is presented in both English and Spanish.

A total of seventy-three men and women from the United States, Asia, and Latin America received fellowship support to conduct individual research or participate in ongoing research projects at various STRI facilities during the past year. Fellowships and assistantships were funded by the Smithsonian, the EXXON Corporation, the Jessie Smith Noyes Foundation, and other private donors. In addition, two senior scientists, Heinz Brucher from Argentina and Kizhakkedathu Mathai

Kochummen from Malaysia, were awarded fellowships for advanced studies in tropical biology. Due to increased efforts in informing the scientific community in other countries of the availability of these programs, STRI has had more participants from developing nations.

Facilities Development

STRI's ambitious plans to improve the quality of facilities have moved forward. On Barro Colorado Island, design of a new dormitory, as well as kitchen, dining, and conference rooms, are near completion. All will be sited on the slopes above the existing dock facilities. Plans for a major new research center at the Tivoli Site, the Earl S. Tupper Research and Conference Center, are almost complete with construction to begin in 1987. Finally, designs for new dormitories at Naos and Gamboa are nearing completion.

Staff Changes and Appointments

Mrs. Leonor Motta became STRI executive officer after several years in a legal executive position with the Panama Canal Commission. Photographer Carl Hansen now leads the Photo Department at STRI. A new computer specialist, Francisco Rivera, came to STRI from IBM Panama. Carmen Sucre, formerly STRI's budget officer, replaced Hernando Leyton, STRI's personnel specialist. Argelis Roman, former biological assistant at STRI's Galeta Marine Lab, replaced Georgina de Alba in the Office of Educational Programs for one year, while Mrs. de Alba is in England on a Webb fellowship. Finally, Joseph Bryan, Captain "Jack," retired in June. Jack came to STRI in 1969 and as captain of the research vessel has contributed to the success of the research of many scientists. David West, from the electronics division of the Panama Canal Commission, was hired to take his place.



MUSEUMS

Tom L. Freudenheim, Assistant Secretary for Museums

Anacostia Neighborhood Museum

During 1986, the Anacostia Neighborhood Museum featured the exhibition *The Renaissance: Black Arts of the Twenties*. Public programming in support of this exhibition included special performances by the D.C. Youth Ensemble, actor William Marshal, and puppeteer Schroeder Cherry. Lectures by historian David Levering Lewis, *Washington Post* columnist Dorothy Gilliam, and Renaissance artist/illustrator Prentiss Taylor were also presented. A workshop designed to help teachers and members of the community plan Black history programs was presented, and a five-day seminar on Black arts of the 1920s for area elementary and secondary teachers was offered for credit. In addition, the Smithsonian's Office of Elementary and Secondary Education supported programs on "Langston Hughes," "From These Roots," "The Cotton Club," and "The Creation." With the Smithsonian's Office of Museum Programs, the museum produced *Race Movies: Popular Art of the Renaissance*, which received a National Association of Government Communicators' Golden Screen Award.

Research, begun in 1985, continued for the upcoming exhibitions: *Climbing Jacob's Ladder: The Development of the Black Church, 1740-1877*, and *Hidden Contributors: Black Innovators and Inventors*, which entailed travel to major repositories and historical societies to locate artifacts, working models, memorabilia, and visual images of the inventors.

The exterior of the Anacostia Museum Annex was completed during 1986. Interior finishing will take place during early 1987, and staff housed at the old Carver Theater will move into the new Fort Stanton facility later in 1987. The facility will provide much needed space for the education staff, an exhibition hall, and other public spaces.



Filming a public service announcement for an Anacostia Neighborhood Museum exhibition, Mercer Ellington, son of the late Edward "Duke" Ellington, is seen with the sculpture *Ethiopia Awakening* by Meta Warick Fuller.

Archives of American Art

The Archives of American Art made substantial progress in strengthening its collections and improving its service to scholarship in fiscal year 1986. New collections of correspondence, photographs, and other records reflect most of the twentieth century and portions of the nineteenth century.

The largest acquisition in 1986—fifty cartons of the business and exhibition files of the Midtown Gallery in New York—includes hundreds of letters to and from such prominent artists as Isabel Bishop, Paul Cadmus, Philip Guston, and Waldo Peirce. A single, slim exceedingly rare volume of satiric and slightly off-color verse about Rockwell Kent is also a Peirce item; bound in the volume are a Kent lithograph and a Peirce watercolor. Among other important collections added to the Archives' holdings are the records of the Robert Carlen Gallery in Philadelphia; a vivid diary kept chiefly in the 1920s by the New York artist James Britton, together with sketchbooks and his lengthy reminiscences; manuscript writings of the influential painter John Graham; and large groups of the papers of Arthur Carles, Joseph Cornell, Hugo Gellert, Morris Louis, Perry Rathbone, and Aline Meyer Liebman, who conducted prolific correspondence with Alfred Stieglitz and, to a lesser extent, with Ansel Adams, Thomas Hart Benton, John Marin, and Georgia O'Keeffe. A more unusual collection, donated by the Whitney Museum, consists of 950 sketches by Reginald Marsh, to be added to the Marsh papers already at hand.

The Archives' collecting projects in Philadelphia and Chicago also moved forward with productive results. Surveys of art-related records in the libraries, museums, and historical societies of both cities are now completed, and the search for privately held collections of papers is well under way. In fiscal year 1986 the Archives received thirty-five rolls of film representing selected materials identified in the Philadelphia project and several additional groups.

Thirty-two hundred research visits to the Archives by curators, Smithsonian fellows, graduate students, and other researchers show that the field of art history is thriving. The rate of publication, based on Archives sources, remained high in 1986. New work on American regionalism, abstract expressionism, Boston painters, art in the Southwest, New Deal art, early American modernism, and documentary photography leaned heavily on the collections, as did biographies of Benjamin West, John Singer Sargent, Jacob Lawrence, Ernest Flagg, and John Stuart Curry and large-scale exhibitions of works

of David Smith, Diego Rivera, John Frazee, and Hiram Powers.

New cataloguing procedures were implemented in 1986 to take advantage of computer technology. Detailed information on all incoming collections is now entered in the Smithsonian mainframe computer and can be called up by researchers at each of the six regional centers. The inventory, one-third completed, of the Archives' 75,000 works of art on paper is also available through the same means.



John Graham (*left*) and Arshile Gorky are shown in this photograph, circa 1934, from the John Graham Papers in the Archives of American Art.



Arthur M. Sackler Gallery and Freer Gallery of Art

A yearlong effort culminated in the Smithsonian's purchase of the finest existing collection of Persian and Indian paintings and manuscripts for the Arthur M. Sackler Gallery. This collection, its whereabouts unknown since World War II, was assembled between 1900 and 1943 by Henri Vever, a Parisian jeweler. It includes approximately five hundred manuscripts, paintings, calligraphies, and book bindings, and represents a comprehensive survey of the art of the Persian book.

Preparations for the opening of the Arthur M. Sackler Gallery called forth a major effort from the staff that serves both the Sackler and the Freer. Among the thirty new staff members is Kyoichi Ito, from Japan, who works in the traditional Oriental Art Restoration Studio.

Conservation staffs, under W. T. Chase III and Ryo Nishiumi, spent 1986 preparing the Sackler collections for public viewing. A major installation plan for the 1,000 objects was produced by the design and installation staff under head exhibition designer Patrick Sears.

Professor James L. Wescoat, from the University of Chicago Department of Geography, completed his first summer at the center under a Smithsonian-Rockefeller Foundation Residency in the Humanities. Dr. Wescoat's research will lead to an exhibition on Mughal gardens.

In 1986, Wheeler Thackston, an instructor at Harvard University, was awarded a Rockefeller residency to begin in spring 1987. Dr. Thackston will be studying Timurid inscriptions on paintings in the Freer and Sackler.

The Edward Waldo Forbes Fund—an endowment to further scientific study of the care, conservation, and protection of works of art—was established by the bequest of the late John S. Thacher, former director of Dumbarton Oaks and founding member of the Freer Visiting Committee. The fund was named in memory of the late conservation pioneer and director of the Fogg Art Museum. The bequest will allow for the training of conservators from museums in Asia.

Arthur M. Sackler Gallery

His Highness Prince Sadruddin Aga Khan, former commissioner of refugees at the United Nations and a noted

This sixteenth-century page comes from an album thought to have been assembled for the Mughal emperor, Shah Jahan (reigned 1628–57). It was included in the Islamic section of the first major cross-cultural exhibition of calligraphy at the Freer Gallery of Art, *From Concept to Context: Approaches to Asian and Islamic Calligraphy*.

collector of Islamic art, was among those who gathered May 19 for the first meeting of the Arthur M. Sackler Gallery Visiting Committee, an advisory group to the Secretary of the Smithsonian. Other members of the committee are Charles Blitzer, director of the National Humanities Center; Professor Kwang-chih Chang of Harvard University; Cynthia Helms, a Washington writer; Porter McCray, former head of the JDR III Fund; George McGhee, former American ambassador to Turkey; Henry Millon, dean of the Center for Advanced Studies in the Visual Arts of the National Gallery of Art; Congressman Norman Y. Mineta (D-California); Cynthia Polsky, distinguished collector of South Asian art; Professor Edith Porada of Columbia University; Gillian Sackler, president of the Arthur M. Sackler Foundation for the Arts, Sciences, and Humanities; Professor Yoshiaki Shimizu of Princeton University; Professor Seymour Slive of Harvard; and Michael Sonnenreich, a director and the legal counsel for the Sackler Foundation.

The final major shipment of Sackler objects for the permanent collection arrived in late July, and a group of twenty-three ancient Near Eastern objects were transferred to the Sackler from the Hirshhorn Museum and Sculpture Garden. The gallery also received its first gift from a living Japanese artist, a series of six woodblock prints by Fumio Kitaoka. Six other contemporary Japanese woodblock prints, gifts of Donna Saunders of Portsmouth, New Hampshire, and a contemporary ceramic jar from the MYC of Tokyo (a cultural exchange institute) were also added to the Japanese collection. An important Kalpasutra manuscript from western India dated 1411 was given by Mr. and Mrs. Charles Page of San Francisco.

Staff members explored possibilities for future exhibitions exchanges with Nobuyoshi Yamamoto and Yuichi Hiroi, director and assistant director, respectively, of the Fine Arts Division of the Japanese Agency for Cultural Affairs; Hayato Ogo, assistant director of the Exhibitions Division of the Japan Foundation; Masao Ito, deputy director of the New York office of the Japan Foundation; and Makato Hinei, a cultural officer of the Embassy of Japan.

Freer Gallery of Art

The curatorial staff introduced the public to the growing collection of the art of writing in a major cross-cultural exhibition and publication, *From Concept to Context*:

Approaches to Asian and Islamic Calligraphy, which opened on July 29.

The exhibition was the museum's first comprehensive look at an art which, in Asia and the Near East, is considered to represent the pinnacle of creative achievement. The 165-page catalogue was written by the three exhibition organizers: Dr. Shen Fu, curator of Chinese art, Dr. Glenn Lowry, curator of Near Eastern art, and Ann Yonemura, assistant curator of Japanese art. The exhibition was planned to coincide with the Twenty-Sixth International Congress of the History of Art held in Washington.

Japanese exhibitions in the past year included the following. *Meisho-e* and *Screens of Landscapes and Famous Places* both featured representations of well-known Japanese landmarks. *Scholar-Painters of the Nanga School* featured a group of eighteenth- and nineteenth-century artists who admired and emulated the qualities of Chinese painting. *Garden Potteries and Official Kilns: Clan-sponsored Ceramics in the Edo Period* included thirty-eight ceramic objects made under the direct sponsorship of feudal lords. And *Literary Themes in Japanese Art* illustrated interpretations of themes from Japanese literature.

Chinese Bird and Flower Paintings featured subject matter favored by Chinese artists through many centuries.

Wonders of Creation, Oddities of Existence: An Exhibition in Celebration of Halley's Comet offered opportunities to examine Near Eastern attitudes toward the cosmos from the thirteenth through the eighteenth centuries.

The Gods of Indian Asia included sculptural and painted images of Buddhist and Hindu deities from the Indian subcontinent and Indonesia.

Exhibitions from the American collection included *Arrangement in Yellow and Gold*, a selection of works by James McNeill Whistler, and nineteen paintings by Thomas Wilmer Dewing.

Among the lectures in the thirty-third annual series was the John A. Pope Memorial Lecture, "Sixteenth-Century Ogama Ceramics from Seto and Mino," by Rupert Faulkner of the Victoria and Albert Museum, London. Other lectures included "Life in Ancient Japan: Treasures from Recent Excavations," cosponsored with the Embassy of Japan and delivered by Richard Pearson of the University of British Columbia, and the Rutherford J. Gettens Memorial Lecture, "East and West: Climates for Oriental Art," by Robert M. Organ, former director of the Smithsonian Conservation Analytical Laboratory.

Notable additions to the permanent collection included three works of Japanese calligraphy; a Chinese pottery ewer from the Warring States period (481-221 B.C.) given by Dr. James D. and Mrs. Ann S. Ling of Potomac, Maryland; a nineteenth-century Chinese wooden birdcage with twenty-nine accessories in lacquer and ceramic, a gift in memory of Isabelle Ingram Mayer from Robert H. Ellsworth of New York City; Chinese and Japanese ceramics and Chinese lacquer from Elizabeth Gordon Norcross of Adamstown, Maryland; and a gift of Chinese K'ang Hsi period (1662-1722) blue-and-white porcelains for the Peacock Room from the Mary Livingston Griggs and Mary Griggs Burke Foundation.

Among the purchases made in 1986 were a Shang dynasty Chinese bronze vessel of the *chiieh* type from the first-half of the second millennium B.C.; two eighteenth-century Rajput paintings from India; four examples of Chinese calligraphy; and a sixteenth-century Chinese inlaid lacquer tray.

The Boston architectural firm of Shepley, Bulfinch, Richardson and Abbott continued to work toward a design that will eventually link the Freer with the Arthur M. Sackler Gallery and expand and renovate the technical laboratory, exhibitions space, and collections storage at the Freer.

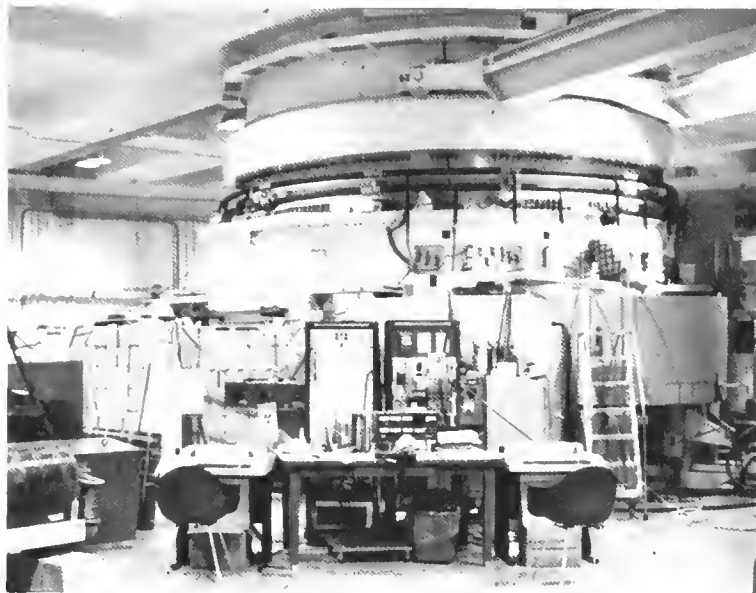
Conservation Analytical Laboratory

Concerned with all aspects of the conservation, technical study, and analysis of museum objects and related materials, the Conservation Analytical Laboratory (CAL) operates interrelated programs in archaeometry, conservation science, conservation treatment, and conservation training and information. While research and development activities are emphasized, CAL also provides advice and assistance to museum professionals in the Institution and outside museums, as well as information to the general public.

In the archaeometry program, the highly successful results obtained in the two major projects for long-term concentration of archaeological research were gratifying. The study of yellow firing Hopi ceramics made great progress, and the results have attracted a sizable number of requests for collaborative projects in American Southwest archaeology. Similarly, the work on ceramics from the Helmand and Indus Valley civilizations was so successful that Italian and French archaeologists working on this subject in this Middle Eastern area have expressed the wish for further formalized cooperative arrangements.

For these projects and a number of other ceramics provenance studies, including the ongoing work on Spanish and American majolica, a total of 1,400 trace element characterizations, using neutron activation analysis, were performed at the CAL facility at the National Bureau of Standards (NBS) research reactor. The collaborative program with NBS on lead isotope analysis concentrated on Chinese bronze vessels from the Sackler collection. Analyses performed on 185 vessels from the Shang and Zhou periods yielded highly interesting results which were reported at a conference in China in fall 1986. Another collaborative project with NBS, the autoradiography of paintings, continued studying works by Thomas W. Dewing, while a new study of the oeuvre of Albert P. Ryder was started. Another new project got under way in which CAL's excellent facilities for organic chemical analysis are utilized for the characterization and identification of natural resins used in Southeast Asia on ethnographic artifacts. Studies on ancient and historic technologies concentrated on a variety of subjects, including Korean celadons and Chinese red glazes, Islamic frit wares, Neolithic plasters from the Middle East, Indian bronze mirrors, and seventeenth- and eighteenth-century music wire.

Postdoctoral fellows in materials analysis studied the developments in ironworking technology in Britain during the Roman period, and the composition and technology of western Mediterranean Islamic ceramics. The



The Conservation Analytical Laboratory's special facility at the National Bureau of Standards research reactor is used for neutron-activated autoradiography of paintings.

Smithsonian Archaeometry Research Collections and Records data base continued to be developed but already proved its great utility for archaeological research through the number of short- and long-term visitors who come to work with it. A week-long workshop at CAL of Costa Rican and American anthropologists—centered around investigations of ceramic production and distribution in the Greater Nicoya area of Costa Rica—proved highly successful because of the immediate availability of the research data base.

In conservation science, an important initiative was the joint project—with the Getty Conservation Institute and the Canadian Conservation Institute—on the effects of fumigants, commonly used for insect control, on the materials of museum objects. Another new study investigates the validity of accelerated aging of paper, often used in studies of relative stabilities of different papers or the long-term effects of certain conservation treatments. Studies of heat and moisture transport in the walls of various museum buildings continued to yield increased understanding of the interaction between climate control installations and the stability of building fabrics. The first phase of a project exploring the humidity-induced dimensional changes in woodwind instruments during playing was completed; it is expected that possible preventive measures will be investigated next. Research con-

tinued on the effects of washing treatments of aged papers and on the effects of light bleaching of discolored paper under various conditions. Other research included the effects of weighting of silk and the removal of latex backings from carpets. In support of conservation in Smithsonian museums and bureaus, a number of small projects were undertaken to identify materials or deterioration products and to advise on the suitability of modern materials for use in storage or exhibition. In the conservation treatment program, work on a number of diverse objects from Smithsonian collections not only served to support conservation efforts around the Institution, but often involved the development and experimental application of new treatment techniques. Of special interest is the work on the consolidation, excavation, and restoration of a group of Neolithic plaster statues from Jordan, and the on-site support extended to the archaeological team working at the important site of Harappa.

CAL's conservation training program saw the successful implementation of a new initiative to train furniture conservators in a program combining intensive course work and home study. Of the seventy-five craftspeople who applied for the first class, seven were selected and are expected to be graduated after four years of study. The series of advanced specialist courses was continued, with courses on such subjects as analysis of historic textile dyes, conservation of carved wooden surfaces, and insect control in textile collections. CAL also continued to host conservation interns at various levels of training and experience. A number of these interns came from other countries, including Canada, Belgium, West Germany, and Venezuela. The public conservation information program answered about thirty inquiries per week from conservation professionals from other institutions and from the general public. The present effort of transferring CAL's information files into the international Conservation Information Network, which will allow the laboratory on-line access to this new specialized data base, is part of a collaborative project with the Getty Conservation Institute and the Canadian Heritage Information Network.

October 6, 1986, marked the tenth anniversary of the Cooper-Hewitt's rebirth as the Smithsonian's National Museum of Design. Acquired by the Smithsonian in 1967, the world-renowned collection of decorative art objects, textiles, wall coverings, drawings, and prints was made part of the Cooper Union for the Advancement of Science and Art in 1897.

A proposed expansion project will provide critically needed space for program offerings. Hardy Holzman Pfeiffer Associates, the architectural firm that restored the Carnegie Mansion, which houses the Cooper-Hewitt, was selected for the expansion project. The National Campaign Committee, started last year as part of the expansion project, has increased in size. And the Professional Committee—which includes such leading designers and architects as Mario Buatta, Mary McFadden, Richard Meier, and Lella Vignelli—has also pledged its efforts to the expansion project.

Golden Eye: An International Tribute to the Artisans of India, a major component of the yearlong Festival of India, brought to this museum objects designed by eleven Western designers and crafted by artisans in India. Other exhibitions with an international dimension were *The Modern Spirit: Glass from Finland*; *Toys from the Nuremberg Spielzeug Museum*; *Treasures from Hungary: Gold and Silver from the Ninth to the Nineteenth Century*; and *Memphis·Milano*, featuring the design style developed by a consortium of international designers who call themselves "Memphis."

Several exhibitions provided a setting for objects in the museum's collections. Items for travel were included in *Bon Voyage: Designs for Travel. Playing Cards*, which presented a historical overview of the subject, and *Advertising America* both drew heavily upon the collection. The Cooper-Hewitt premiered the first exhibition ever devoted to the life and work of one of modern ballet's most creative women, the Russian-born Bronislava Nijinska. And *Embroidered Ship Portraits*, the first major American exhibition to feature this nineteenth-century folk art, was planned as a tribute to the tall ships participating in the Statue of Liberty centennial celebration.

The J. M. Kaplan Foundation gave \$100,000 to help underwrite museum publications on architecture. Two new titles were added to the Cooper-Hewitt's bibliogra-

The Cooper-Hewitt Museum's Great Hall was transformed into an Indian "street" by Sir Hugh Casson with Rajeev Sethi for the exhibition *Golden Eye: An International Tribute to the Artisans of India*.



phy: the exhibition catalogue *Bon Voyage: Designs for Travel and Theater Designs in the Collection of the Cooper-Hewitt Museum*, bringing to twenty-one the number of titles in this series on the museum's major collections. *The Amsterdam School: Dutch Expressionist Architecture, 1915-1930*, published by MIT Press, was also issued in German by Deutsche Verlags-Anstalt. In addition, the museum collaborated with the Hungarian National Museum and the Nuremberg Spielzeug Museum in the preparation of publications for *Treasures of Hungary: Gold and Silver from the Ninth to Nineteenth Century* and *Toys from the Nuremberg Spielzeug Museum*. The museum's fifteen-volume Illustrated Library of Antiques continued to sell well through the Book-of-the-Month Club, and two books from the Immobile Objects series, *Cities* and *Urban Open Spaces*, have become standard reading in architecture and urban studies programs in American and foreign universities. The New

York State Conservation Consultancy, which was established at the Cooper-Hewitt with a grant from the New York State Council on the Arts, continues to publish bulletins on the care of collections of fine and decorative arts.

The museum's Masters Degree Program, which graduated its third class this spring, is the only museum program in the world to train young professionals in the study of European decorative arts. One former student, an assistant curator of American art at the Philadelphia Museum of Art, had an expanded version of her master's thesis published by the University Press of Virginia in fall 1986. The Helena Rubinstein Foundation again provided \$10,000 for scholarships.

The museum continued to offer courses for college credit through Parsons School of Design/The New School and classes and workshops for the general public. More than ninety lectures, weekend seminars, walking tours, and workshops were offered on topics such as English decorative arts, great American cities, and design in the 1950s. More than thirty interns were trained in almost every department of the museum. The Sidney and Celia Siegel Fellowship program sponsored five paid interns, and a grant from the New York State Council on the Arts paid for a ten-month intern in the textile conservation department. Smithsonian funds made a minority intern position possible.

Major acquisitions this past year included the Robert L. Metzberg collection of 283 pieces of antique cutlery dating from the sixteenth through the nineteenth centuries, and a framed classical garden watercolor by the Dutch landscape artist Isaac de Moucheron, a gift of Mrs. Christian Aall through the Port Royal Foundation. The museum also purchased a "Carlton" sideboard designed by the Memphis artist Ettore Sottsass, Jr. Proceeds from the Decorative Arts Committee's benefit dinner for Mrs. Henry Parish II allowed the purchase of two wallpaper sample books used originally by French firms in the 1820s.

During the past year, a series of think-tank conferences was held with prominent design professionals to discuss issues of both theoretical and practical significance to the museum. Plans for further conferences are under way as the Cooper-Hewitt looks ahead to an exciting future.

The Scottish thistle was used as the inspiration for this commemorative gilt-bronze goblet made for Andrew Carnegie by Tiffany and Company, circa 1907. The goblet was added to the Cooper-Hewitt Collection, now housed in a building that was once Andrew Carnegie's home.



Hirshhorn Museum and Sculpture Garden

The Hirshhorn Museum and Sculpture Garden, a major museum of modern and contemporary art, maintained an active exhibition schedule and acquisitions program this fiscal year. Related films, lectures, concerts, symposia, tours, and other educational activities supported these programs. The museum's departments of conservation, registration, photography, and the reference library continued to offer technical support to staff and scholars.

The first major exhibition of this fiscal year, *A New Romanticism: Sixteen Artists from Italy*, October 3, 1985–January 5, 1986, was organized by former curator Howard N. Fox. The exhibition was the first in America to focus on the romantic, spiritual impulse of recent Italian art and featured works by sixteen artists. (Tour: Akron Art Museum, Ohio, January 28–April 6, 1986.) *Selections from the Collection of Marion and Gustave Ring*, October 17, 1985–January 12, 1986, consisted of fifty works from the collection of these longtime friends of the museum, both of whom died in 1983. Among European modernists represented in the exhibition were Ernst Barlach, Edgar Degas, Henri Matisse, Giorgio Morandi, Max Pechstein, Odilon Redon, and Edouard Vuillard. Such American masters as Milton Avery, Stuart Davis, Richard Diebenkorn, and Adolph Gottlieb were also represented.

Directions 1986, February 6–March 30, 1986, was the fourth in a series of group shows initiated by the museum in 1979 to focus on common concerns, attitudes, or stylistic developments in contemporary art. Curator Phyllis Rosenzweig chose thirty-six works organized into two sections: "Painting into Nature," with works by Alice Fellows, Peter Fleps, Melissa Miller, and Yolanda Shashaty; and "Toward the Baroque," in which Robert Morris, Hope Sandrow, Frank Stella, and James Turrell were represented. *Robert Arneson: A Retrospective*, April 30–July 6, 1986, organized by the Des Moines Art Center, was the California sculptor's first major museum show on the East Coast. The seventy works in the exhibition documented the artist's career—from early humorous pieces to current works in which the theme is nuclear war. The original exhibition and national tour were supported by grants from the Anna K. Meredith Endowment Fund, the National Endowment for the Arts, and John and Mary Pappajohn. *Selections from the Joseph H. Hirshhorn Bequest*, August 7–November 16, 1986, was chosen from the more than 5,300 objects bequeathed to the museum by Mr. Hirshhorn in 1981. The eighty-five paintings and sculptures and fifty-three works on paper included pieces by such European and American



Among the notable acquisitions of the Hirshhorn Museum this year was Jean Dubuffet's *Hunt for the Two-Horned Creature*, 1963, acquired through the Joseph H. Hirshhorn Purchase Fund.

masters as George Bellows, Fernando Botero, Mary Cassatt, Willem de Kooning, Arshile Gorky, Joan Miró, Henry Moore, Malcolm Morley, Georgia O'Keeffe, Pablo Picasso, and Gino Severini.

Smaller exhibitions included *Relief Sculpture: Selections from the Museum's Collection*, January 28–April 13, 1986, organized by Judith Zilzer, associate curator. Frank Gettings, curator of prints and drawings, organized two shows: *Fantasies and Allegories: Prints and Drawings from the Museum's Collection*, December 11, 1985–March 26, 1986; and *Interiors: Prints and Drawings from the Museum's Collection*, March 26–July 28, 1986. Mr. Gettings also organized two small shows of works on paper from the museum's collection for the Smithsonian Castle. *Surrealist Art: Selections from the Hirshhorn Museum and Sculpture Garden*, an exhibition of fifty-seven works chosen by Valerie Fletcher, associate curator, was organized by the Smithsonian Institution Traveling Exhibition Service for a national tour through March 1987. A catalogue with an essay by Ms. Fletcher accompanied the show.

In addition to creating its own exhibitions, the museum also lent 192 objects to fifty-seven institutions this fiscal year. Among the works lent were four paintings by Franz Kline to the Cincinnati Art Museum for *The Vital Gesture: Franz Kline in Retrospect*; four works by Jacob



Early in 1986, after the Joseph H. Hirshhorn Bequest brought eleven duplicate sculptures to the Hirshhorn Museum's permanent collection, these two casts of Henry Moore's *Seated Figure*, 1956–57, were photographed side by side in the museum's sculpture garden. The work in the background was later offered for sale.

Committee of the Smithsonian Associates partially funded a two-day symposium for docents, "Pulse: A Practicum on Current Ideas and Approaches in Museum Education." "Currents," a seminar for high school juniors from the Washington, D.C., area, was initiated. Its first focus was *A New Romanticism*, the Italian painting exhibition; the second session was devoted to the Robert Arneson retrospective. The summer intern program continued with three undergraduate students. Regularly scheduled free films about artists, films by artist-filmmakers, and a special program of films for young people were vital aspects of the museum's outreach to the public.

As part of an ongoing program to realign the late Joseph H. Hirshhorn's private collection to make it more suitable for a public institution, the board of trustees directed that thirty-five works of art, including a number of duplicate casts of sculptures, be sold at auction. In accordance with the original understanding with Mr. Hirshhorn, the proceeds from these sales will be used solely for future acquisitions.

In addition to the works from Mr. Hirshhorn's bequest, which were accessioned in 1986, the museum's permanent collection was enriched by eighteen gifts and twelve purchases. Included were a larger-than-life ceramic bust, *Elvis*, 1978, by Robert Arneson; Richard Diebenkorn's painting *Berkeley Number 22*, 1954; Jean Dubuffet's *The Hunt for the Two-Horned Creature*, 1963; Anselm Kiefer's *The Book*, 1985; *Soft Engine for Airflow, with Fan and Transmission*, 1966, the museum's first soft sculpture by Claes Oldenburg; and *Quaqua! Attaccati là!*, 1985, a relief painting by Frank Stella.

Lawrence to the Seattle Art Museum for *Jacob Lawrence, American Painter*; and five paintings to the High Museum of Art in Atlanta for *The Advent of Modernism: Post-Impressionism in North American Art, 1900–1918*, co-curated by Judith Zilcher. The museum also made significant loans to a number of foreign shows, including *Futurismo e Futurismi* at the Palazzo Grassi, Venice; *Naïvety in Art* at the Setagaya Art Museum, Tokyo; *Oskar Kokoschka* at the Tate Gallery, London; and *Europe-America: The History of an Artistic Fascination since 1940* at the Museum Ludwig, Cologne.

The education department continued to bring the museum's exhibitions and permanent collection alive for audiences ranging from elementary school children to senior citizens. With ninety docents, the department conducted tours for more than 15,000 visitors. The Women's

National Air and Space Museum

July 1, 1986, marked the tenth anniversary of the opening of the National Air and Space Museum (NASM). During this remarkable decade more than 105 million people have visited NASM, making it the most popular museum in the world. New research efforts encompassing publications, exhibitions, collections, and education highlight the contributions of the museum toward the Smithsonian's goal to increase public awareness of aviation and space exploration. It is fitting that after ten years, the museum continues to be a leader in aviation and space historical research.

This year a new Program for the History of Space Science was developed in cooperation with Johns Hopkins University. Research staff from the Office of the Associate Director of Research and the Space Science and Exploration Department worked jointly with faculty members of Johns Hopkins to document the history of ultraviolet astronomy. This included a major study of the origins of the Hubble Space Telescope, as well as developing undergraduate and graduate degree programs in the history of space-related science and technology. Additional support was received from the National Aeronautics and Space Administration (NASA) and the National Science Foundation.

Two other notable programs involving the history of science and technology were begun. The Glennan-Webb-Seamans Fund for Research in Space History was established to support the study of historical aspects of the management, scientific, and engineering issues associated with the development of the nation's space program. The Space Science and Exploration Department received support from the Sloan Foundation for an exploratory video-history program to aid research and historical documentation programs now under way in the Smithsonian Institution.

Dr. Leo Goldberg occupied the Martin Marietta Chair in Space History. Dr. Goldberg performed detailed historical research into aspects of his career with the international astronomical community, the Orbiting Solar Observatory, as well as his contributions to understanding the physics of the solar atmosphere. In addition, Guggenheim Postdoctoral Fellow Charles Zeigler studied the history of cosmic ray physics.

The museum continued to expand its role as an international center for study of the history of flight with the selection of three scholars from other nations to conduct historical research. General Pierre Lissarrague—pilot, educator, historian, and former director of the Musée de l'Air et de l'Espace near Paris—occupied the Charles A. Lindbergh Chair of Aerospace History. General Lissar-

rague studied early experimental flight to learn how technology and science interacted to achieve mechanical flight. Peter W. Brooks of Great Britain, a respected author of several aviation publications and a specialist in analyzing aircraft structures and performance, became the first International Fellow. He researched the history of the autogiro and its contribution to the later development of the helicopter. Verville Fellow N. Kivanc Hurturk, who has worked in the field of commercial aviation as a writer and editor, performed considerable research on Turkish aviation from 1911 to the present.



A popular attraction for visitors to the National Air and Space Museum is the model replica of the pterodactyl *Quetzalcoatlus northropi*, the largest creature ever to fly. The pterodactyl, which lived 65 million years ago, was reconstructed to star in the museum's new film *On the Wing*, which explores the history of flight.

Research that will produce a history of the airlines of Asia progressed throughout the year. Liaison with Chinese authorities continued in the development of a cooperative program to produce a book on the history of air transport in China.

At NASM's Center for Earth and Planetary Studies (CEPS), basic research on the use of remote sensing of terrestrial and planetary surface features continued with emphasis on desert regions of Earth and structural landforms on Mars. Analysis of satellite images of the western African country of Mali concentrated on determining changes that took place in the region over a nine-year period. Analysis of digital Landsat data for the Inland Niger delta region revealed a significant reduction in the area of surface water. This research was documented by fieldwork and samples taken in 1985.

Investigations using satellite data of the hyperarid desert core in the western desert of Egypt and northern Sudan continued in 1986 with the mapping of sand sheet deposits in the area where the Space Shuttle Radar Experiment revealed buried drainage patterns. The investigations revealed that these channels were the last areas of human habitation in the region and dated back to the Neolithic age.

Planetary research concentrated on several new ways for analysis of *Viking* orbital data of Mars. Using individual images of the surface of the planet taken through different wavelength filters, multispectral data were used to map compositional variations on the planet. Mapping of structural features also continued, using newly developed computer methods together with the initiation of a new study of terrestrial analogs of planetary surface features in the Columbia Plateau of Washington.

The research program progressed with the publication of several new works by museum authors. The Aeronautics Department continued widely diversified programs of research and writing, producing a number of new publications. *Gatchina Days: Reminiscences of a Russian Pilot*, the diary of Alexander Riaboff edited by Dr. Von Hardesty, provided a rare look at the aeronautical scene in Russia during the turbulent years of the revolution and civil war. *Images of Flight: The Aviation Photography of Rudy Arnold*, by E. T. Wooldridge, offers a first-time look at the world of Rudy Arnold, one of the premier aviation photographers of the 1920s and 1940s. Frances Kianka's translation of *A History of French Military Aviation*, written by Lindbergh Professor Pierre Lissarrague and Charles Christienne, was also published.

Historical research and writing continued in the Space Science and Exploration Department in many areas, in-

cluding the origins of space science in the V-2 era, early scientific satellite proposals, the Apollo-Soyuz program, early meteorological satellites, the evolution of space suit technology, and the planetary science community's association with the Hubble Space Telescope Project. *The Space Astronomy Oral History Project Catalog* was reprinted. In addition, the curatorial departments collaborated in producing the *National Air and Space Museum Research Report 1985*.

Museum books received several awards this year. *The National Air and Space Museum Research Report 1985* and *United States Women in Aviation 1930-1939* received Awards of Excellence from the Washington Chapter of the Society for Technical Communication (STC); the *NASM Publications Catalog* and *Focus on Flight: The Aviation Photography of Hans Groenhoff* received Awards of Merit from the STC. *The National Air and Space Museum Research Report 1985* also received a second-place award from the National Association of Government Communicators in the 1986 Blue Pencil Competition.

Another highlight of a productive publishing year was the launching of *Air & Space/Smithsonian* magazine in April. Patterned after the successful *Smithsonian* magazine and designed with a perceptible kinship to the latter, *Air & Space/Smithsonian* was designed for the lay reader with a curiosity about the varied enterprises and sciences that relate to flight in all its forms.

With a view toward exploiting the vast potential of the National Aeronautical Collection as a teaching aid, a series of lectures based on objects in the collection were developed in cooperation with the museum's Office of University Programs. Formal classroom lectures on aviation history and basic aerodynamics, given by museum staff and visiting fellows, will provide the necessary background for students to understand the history and technological development of the objects. An abbreviated course was conducted in July 1986 with selected members of the Wellesley College faculty. A two-week course for Wellesley students will be conducted in January 1987.

The museum continued its commitment to cooperative programs by joining the Massachusetts Institute of Technology in a venture to recreate the mythical flight of Daedalus from the island of Crete to the mainland of Greece with a man-powered aircraft. A feasibility study was completed in April, and rollout of the prototype aircraft occurred in September. The recreation of the flight is anticipated in 1987.

Underscoring the importance of public education through exhibitions, the museum opened a major gallery



On November 18, 1985, the Space Shuttle Orbiter *Enterprise* made its last flight aboard a 747 carrier aircraft before landing at Washington Dulles International Airport. At a ceremony on December 6, the *Enterprise* was officially transferred to the National Air and Space Museum collections from the National Aeronautics and Space Administration.

and produced a series of other significant displays. *Looking at Earth* draws on the expertise of CEPS in the field of remote sensing. This new gallery illustrates the many ways man has viewed Earth, from cameras carried by pigeons, to remote sensing devices carried by satellites. Major artifacts include the World War I vintage de Havilland DH-4, the Lockheed U-2, as well as TIROS I, the world's first weather satellite, and the GOES meteorological satellite. A smaller complementary exhibition, *Earth Views*, opened in the Flight and the Arts gallery.

An important aeronautical exhibition was dedicated to the distinguished career of Leroy R. Grumman, gifted aeronautical engineer and founder of the Grumman Corporation. The highlight of the exhibition was a restored F6F-3 Hellcat carrier fighter of World War II fame. The Grumman exhibition served as the centerpiece for the museum's activities commemorating the seventy-fifth anniversary of U.S. naval aviation in 1986. An exhibit in the Hall of Air Transportation commemorated the fiftieth anniversary of air traffic control in the United States.

Voyager: Around the World Without a Pit Stop traced the planning, design, and construction of *Voyager*. This unique aircraft, constructed of lightweight composite materials, will carry Dick Rutan and Jeana Yeager around the world nonstop, without refueling.

Additions to major galleries included a new space food exhibit in *Apollo to the Moon*. Also, the coveralls and helmet worn by Senator E. J. "Jake" Garn, the first U.S. congressman in space, were added in the Space Hall along with a Shuttle Portable On-Board Computer. *Exploring Comets*, an addition to the *Exploring the Planets* gallery, took the visitor through the steps taken by scientists in observing and exploring comets.

Exhibitions were produced with the cooperation of outside sponsors. *Anane and Arianespace: International Launch Resources*, sponsored by Arianespace, Inc., showed the capabilities of Ariane 4 LP, the latest in the series of launch vehicles. *An Acrobatic Satellite: The Three Lives of ICE*, celebrating the first visit of a spacecraft to a comet, was sponsored by NASA's Goddard Space Flight Center. The *Space Science Series, 1986*, funded by NASA, consisted of television monitors displaying press coverage obtained by satellite of current space-related events. Bell Helicopter Textron provided a model of the Bell XV-22 Osprey Tiltrotor which combines helicopter vertical takeoff and hovering capabilities with fixed wing speed.

A significant expansion of the NASM artifact collection was made possible by the acquisition of the Space Shuttle *Enterprise*. This atmospheric test vehicle will



Israeli Prime Minister Shimon Peres visited the National Air and Space Museum on September 15, 1986, with Vice President George Bush. The two leaders were particularly interested in viewing the Grumman F6F Hellcat in the museum's Pioneers of Flight gallery.

serve as a centerpiece for the proposed museum annex at Washington Dulles International airport. Other new space artifacts received included the Homing Overlay Experiment, the Hubble Space Telescope Structural Dynamic Test Vehicle, and a full-scale model of the Tracking and Data Relay Satellite.

During the course of the year, several important aircraft were added to the holdings of the museum. A Soviet-designed MiG-15 was obtained from the People's Republic of China; and a flyable World War II North American B-25 medium bomber was acquired. A Nieuport 28, America's first combat aircraft in World War I, and the oldest Curtiss flying boat extant, a Model F, rounded out an extremely successful year. In addition, restoration work was completed on Smith IV, the museum's rare French-built World War I SPAD XIII fighter.

The space suit collection was evaluated, with both preservation and collection items identified, and physical reorganization of the collection began, assisted in part by a new storage and workroom. Basic preservation tasks were performed on the Space Shuttle *Enterprise* to ensure the craft's condition in outside storage.

A project to catalog all U.S. artifacts currently on the surface of the moon is also under way. The goal is to provide the information required by NASA and other agencies to adopt a policy for preserving and respecting the historical significance of those items before the United States returns to the moon.

During 1986, NASM's Information Management Division established the National Air and Space Archives, a national center for research into aerospace history. The archives is expected to become a clearinghouse for information on the museum's own collections, as well as collections available at non-Smithsonian facilities. The museum staff accessioned 118 new collections during 1986 and hired its first archivist to improve intellectual control of collections already in custody.

The museum has been a leader in the uses of analog videodisc technology for the storage and retrieval of photographic collections. During 1986, NASM Videodisc 3 was released containing 100,000 photos belonging to the U.S. Air Force. With the completion of NASM Videodisc 4, scheduled for early 1987, the USAF's entire collection of pre-1954 historical still photos will be available on videodisc. In addition, the first phase of a pilot project to copy the Wernher von Braun papers at NASA's Alabama Space and Rocket Center, using NASM's System for Digital Display was completed.

During the year, the museum offered, free to the public, ten General Electric aviation lectures, twelve Monthly Sky lectures, six Exploring Space lectures, the annual Wernher von Braun lecture by remote sensing expert John McElroy, the annual Lindbergh lecture delivered by Senator Barry Goldwater, seven aviation films, seven space fiction films, and three symposia. In addition, special lectures were held to commemorate the twenty-fifth anniversary of manned space flight, Black History Month, and Hispanic Heritage Week.

The museum launched a major campaign to save the aviation portion of Movietone newsreel footage. The sponsors—NASM and the University of South Carolina—need to raise \$550,000 to transfer the irreplaceable footage, currently stored on hazardous nitrate-based film, to safety film.

The Samuel P. Langley Theater continues to be a popular attraction. Since opening day, the theater has attracted 16,500,000 visitors. On June 21, 1986, the museum opened the new IMAX film, *On The Wing*, which dramatizes the similarities between mechanical and natural flight and includes flying scenes of the model pterodactyl, *Quetzalcoatlus northropi*. Vice President and

National Museum Act

Mrs. Bush were among the distinguished guests attending the June 19 premiere.

Comet Quest has been the museum's most popular planetarium show to date. The staff of the Albert Einstein Planetarium created a special Halley's comet curriculum guide in conjunction with the American Association for the Advancement of Science. The Planetarium also hosted "Comet Quest: An International Symposium," on December 5 and 6. An interim Planetarium program entitled *Summertime* opened in May.

This year saw an expanded program of training for 168 docents, including thirty-five new volunteers. The museum made greater use of behind-the-scene volunteers to assist in research, collections management, and exhibition activities. A program of training young people interested in museum careers included twenty high school and college interns during the year.

Walter J. Boyne resigned his position as director on August 19, 1986. Dr. James C. Taylor, associate director of the Smithsonian's National Museum of Natural History, was appointed as acting director of the National Air and Space Museum. An advisory committee has been formed to assist Secretary Robert McC. Adams select a new director for the museum.

The National Museum Act was established by Congress in 1966 to enable the Smithsonian, through an annual appropriation, to provide assistance to the museum community specifically in the areas of professional training and research or special studies on museum-related issues. The emphasis has been on projects that are technical in nature and that have broad applicability (support for interpretive exhibitions or for the operating expenses of individual institutions is available from other sources of federal funds). Over the years, priority has been given to projects involving the care and preservation of collections in museums of all types. The Advisory Council, which meets after each deadline, reviewed 182 proposals for fiscal year 1986 funds and recommended fifty-one awards totaling \$629,199. Of that number, 60 percent concerned training and research in conservation.

This year, awards for professional training—which are intended to raise the level of available expertise in the museum field—were made to academic institutions, to museums capable of providing exceptional opportunities through a yearlong internship, and to beginning or practicing conservators for short- or long-term courses. Awards for seminars on controlling the environment of storage and exhibition areas in museums were made to two regional organizations with experience in effectively disseminating information to their constituents. Awards in the research category primarily involved technical issues in conservation and covered a broad range of materials, including archaeological artifacts, paintings, silk fabrics, and works of art on paper. Grants were made to two national associations for programs that provide consultant services either to historical agencies or to museums with collections related to African American culture; another award will support the revision of a standard reference work on cataloguing collections.

National Museum of African Art

One chapter in the National Museum of African Art's history ended and another began on June 15, 1986. The museum was closed to the public so that the staff could begin moving from the museum on Capitol Hill to the new quadrangle complex on the National Mall. During 1986, the museum added significant objects to its collection, opened twelve staff positions, commenced research for future publications, and designed innovative educational programs for people of all ages.

Dr. Christraud Geary, a research associate at the Boston University African Studies Center, was selected for this year's Rockefeller Foundation Residency Program in the Humanities. Dr. Geary's appointment was made possible through a residence fellowship program administered by the Smithsonian Office of Fellowships and Grants.

In the past year, the museum added sixty-three works of art to its collection, including fourteen objects acquired through gift, twenty-six objects acquired through purchase, and twenty-three objects—twenty-two Benin bronzes (Nigeria) and a Bamana (Mali) iron staff—transferred from the Hirshhorn Museum and Sculpture Garden. The museum acquired, with trust funds, a second group of twenty-two works from a private European collection. In addition, 135 non-African materials were transferred from the museum to the National Museum of American History and the National Museum of Natural History.

Particularly noteworthy gifts include a collection of east African beadwork and a rare Koro (Nigeria) head-dress. In fiscal year 1986, the museum acquired several extraordinary objects. Among them is a rare bronze vessel, dated between 1668 and 1733 by thermoluminescent testing, attributed to a small corpus material known as Lower Niger bronzes (Nigeria). Another major acquisition was a unique ivory sculpture attributed to the Vili people (Zaire); it is one of the most celebrated ivory carvings from the Lower Congo region.

The museum presented four exhibitions in fiscal year 1986, the first of which was *History, Context and Materials: Objects from the National Museum of African Art* (November 12, 1985–January 5, 1986), curated by assistant curators Andrea Nicolls and Bryna Freyer. *Go Well,*

My Child (November 26, 1985–January 5, 1986) exhibited magnificent photographs of South Africa. The photographs were donated to the museum by Constance Stuart Larrabee; in collaboration with Alan Paton, she created a photographic portfolio based on his novel *Cry, the Beloved Country*. The exhibition was curated by Sylvia Williams and Judith Luskey, the museum's director and photo archivist, respectively. *The Rising of a New Moon: A Century of Tabwa Art* (November 26, 1985–March 17, 1986) was the first comprehensive study of the art of the Tabwa people of central Africa. Organized by the University of Michigan Museum of Art, this international loan exhibition of eighty works had an accompanying catalogue coedited by Evan M. Maurer, di-



This rare bronze vessel (from Nigeria) collected in the late nineteenth century is attributed to a small corpus of material known to art historians as Lower Niger bronzes. Through thermoluminescent testing, the vessel has been dated between 1668 and 1773. (Photograph by Bruce Fleischer)

rector of the University of Michigan Museum of Art, and Allen F. Roberts, researcher at the University of Michigan's Center for Afro-American and African Studies. The final exhibition organized by the museum was *A Human Ideal in African Art, Bamana Figurative Sculpture* (April 30–June 15, 1986). Featuring forty sculptures from private and public collections in the United States, the exhibition subsequently traveled to The Metropolitan Museum of Art in New York. Dr. Kate Ezra, assistant curator at the Metropolitan Museum, wrote the accompanying catalogue.

Five inaugural exhibitions have been planned and organized by the museum for the grand opening in 1987. They are *African Art in the Cycle of Life*; *Patterns of Life: West African Strip-Weaving Traditions*; *Royal Benin Art in the Collection of the National Museum of African Art*; *Objects of Use*; and *The Permanent Collection of the National Museum of African Art*. Publications were begun in 1986 for the first three exhibitions cited above.

The conservation department at the museum instituted preventive maintenance procedures for the permanent collection, including environmental monitoring and control, integrated pest management for infestation control, and care and handling guidelines. Major conservation for forty-two textiles was begun with a textile conservator.

Funding provided in the fiscal year enabled the museum to add a senior curator to the permanent staff, as well as a writer/editor, a graphic designer, a photographer, and a development office.

The Eliot Elisofon Photographic Archives—one of the largest photographic archives of African art, culture, and environment—is a major research component of the museum. The Smithsonian Archives completed a survey this year of the collection showing holdings of 150,000 color slides and over 70,000 black-and-white photographs, as well as 120,000 feet of unedited film and fifty feature films. Donations included more than 1,200 color slides and 1,500 black-and-white photographs.

The department of education and research nearly doubled its docent corps this year, assembling eighty volunteers for a yearlong training program that will prepare them and the department for the inaugural programs. Barbara Frank, a predoctoral candidate at the University of Indiana, Bloomington, was selected as a fellow through the Office of Fellowships and Grants. Special exhibitions, research programs, and the museum's collection were the focus throughout the year for lectures, films, gallery talks, and demonstrations administered by the education department. Staff members presented lec-



A young boy learns a basket-weaving technique at one of the last public workshops at the Capitol Hill location of the National Museum of African Art on March 8, 1986. (Photograph by Ricardo Vargas)

tures outside the museum on African game boards and sculpture from Zaire.

The museum was host to distinguished scholars, educators, collectors, and representatives from over twenty nations. More than 300 tours were scheduled; owing to space and staff limitations, an equal number of tour requests could not be met. About 100 workshops were presented during the year in the museum, and outreach programs reached more than 2,000 persons at over 100 sites in the Washington, D.C. area.

On November 26, 1985, District of Columbia Mayor Marion Barry cohosted a reception at the museum in recognition of the establishment of the sister cities agreement between Washington, D.C., and Dakar, Senegal. The event was sponsored by the Washington, D.C.–Dakar Cities Friendship Council, a private voluntary organization.

National Museum of American Art

The National Museum of American Art (NMAA) launched new initiatives and continued programs of collecting, exhibiting, studying, and interpreting American fine art. NMAA's Renwick Gallery complemented these endeavors with exhibitions and programs in American crafts, decorative arts, and design; and Barney Studio House, with its exhibits devoted to the arts from the turn of the century, was open for tours and special programs.

Planning and development have been completed for a new NMAA scholarly journal, *Smithsonian Studies in American Art*; the first issue will appear in April 1987. Oxford University Press will publish the journal semiannually. The selecting and editing of articles are the exclusive prerogative of NMAA, with the assistance of an advisory board composed of distinguished scholars in American art. The journal will focus on all aspects of the nation's visual heritage, including decorative arts and crafts, architecture and landscape design, film and video, commercial and graphic design, as well as painting and sculpture.

The American Art Forum, a nationwide group of patrons and collectors, held its inaugural meeting in Washington on May 9–10, 1986. The forum was established to support museum collections and programs and to foster increased appreciation of American art. The annual membership fee is \$2,500. To date, thirty-one members have enrolled, exceeding initial goals for the charter year.

With a grant from the Henry Luce Foundation, the museum has completed a pilot project to test, format, and develop standards for a computerized inventory of American sculpture, which will complement the museum's acclaimed Inventory of American Paintings Executed before 1914. Using the extensive card file on American sculpture developed at the University of Delaware, the pilot project extracted critical information and entered records of more than 14,000 sculptures on a computer data base. Contingent upon the availability of future funding, the museum may proceed with a national survey of sculpture in public and private collections, as well as outdoor monuments and significant architectural sculpture. In undertaking the national survey, the museum has enlisted the cooperation of the American Sculpture Society and the National Park Service.

During fiscal year 1986, the museum organized a number of exhibitions. Most significant, in terms of making its collection better known nationally and of documenting it with an attractive publication, was the *Treasures from the National Museum of American Art* exhibition. With generous support from United Technologies Corpo-

ration, eighty-one of NMAA's most important works are touring to museums in five major American cities, culminating with a final showing at NMAA in 1987. The accompanying book, distributed by the Smithsonian Institution Press, is in its second printing and has won an award for design from the American Association of Museums (AAM).

Art in New Mexico, 1900–1945: Paths to Taos and Santa Fe—the first major East Coast exhibition devoted to the subject—was organized by and shown at the museum this year and will travel to three other institutions. A book, written by NMAA director Charles Eldredge and curators William Truettner and Julie Schimmel and published by Abbeville Press, accompanies the exhibition. This book has gone into a second printing and won special AAM recognition. The exhibition and publication were underwritten by a grant from the Nelda C. and H. J. Lucher Stark Foundation.

To display selections of the objects given to the museum last year by the Container Corporation, the museum presented *Art, Design and the Modern Corporation: The Collection of the Container Corporation of America*, which will tour and be accompanied by an illustrated catalogue. Other exhibitions that continue to tour nationally are *Sharing Traditions: Five Black Artists in Nineteenth-Century America*; *The Woven and Graphic Art of Anni Albers*; and *Exposed and Developed: Photography Sponsored by the National Endowment for the Arts*.

Temporary exhibitions organized or shown at the museum during fiscal year 1986 included *The Graphic Art of George Elbert Burr (1859–1939)*; *Symbols and Ceremonies: Pueblo Indian Watercolors*; *Patrick Ireland: Drawings, 1965–1985*; *Still Lives by Henry Lee McFee*; *Unknown Territory: Photographs by Ray K. Metzker*; *Focusing on Art: Peter A. Juley & Son*; and *Figure Prints: The Washington Print Club 11th Members' Biennial Exhibition*. The Renwick Gallery's exhibitions included *Treasures from the Land: Twelve New Zealand Craftsmen and their Native Materials*; *Masterpieces of Time: Clocks by Wendell Castle*; *The Art of Turned Wood Bowls: The Edward Jacobson Collection*; and *Frank Lloyd Wright and the Johnson Wax Buildings*:

George Catlin's *Pigeon's Egg Head Going to and Returning from Washington*, circa 1837, was among the 445 paintings transferred to the National Museum of American Art from the National Museum of Natural History this year.





Adelyn Breeskin's 90th birthday party attendants at the National Museum of American Art on July 15, 1986, included (left to right): Tom L. Freudenheim, Assistant Secretary for Museums; S. Dillon Ripley, Secretary Emeritus of the Smithsonian; Mrs. Breeskin; and Mrs. Jeannine Clark, Smithsonian Regent.

Creating a Corporate Cathedral. At the Barney Studio House, *Pastel Portraits from Studio House* was shown.

The redesigned Doris M. Magowan Gallery of Portrait Miniatures—which displays examples from the museum's collection and surveys this art form from its genesis in the eighteenth century through the mid-nineteenth century—was reopened this year. The stonework replacement and other repairs on the facade of the Renwick Gallery were completed in 1986. After almost a century of patchwork on the soft brownstone trim, a \$4 million replacement was deemed the only suitable solution. For the first time in almost ten years, the Renwick is unobstructed by barriers and scaffolding.

The museum loaned more than 200 works of art from its collection to museums and institutions in the United States and abroad. The museum published two illustrated brochures that enable visitors to conduct themselves through the collections on tours of special interest: "Afro-American Art" and "Women Artists."

With the assistance of a visiting committee, the museum undertook a study of the Smithsonian's craft programs, resulting in a reaffirmation of the museum's commitment to strong collecting, exhibiting, and study programs in American crafts and related decorative arts at the Renwick Gallery.

The museum received a record total of 1,618 gifts and transfers of works of art during fiscal year 1986. The most important group was a collection of paintings and graphic works of Native American subjects, which had

been on loan from the National Museum of Natural History for almost twenty years and was finally made a permanent transfer to NMAA's collection. Once considered the subject of anthropological study, these art works include more than 400 paintings by the nineteenth-century artist George Catlin. Another significant transfer included forty-eight maquettes, drawings, and other preparatory works created for the Art in Architecture program of the General Services Administration. Also, the museum's Joseph Cornell Study Center, founded in 1978, was enriched by the addition of 119 collages and box constructions—a gift from the Joseph and Robert Cornell Memorial Foundation.

A landmark acquisition by the museum was the painting *William Rush's Model*, by the American artist Thomas Eakins, a gift of NMAA Commissioner R. Crosby Kemper and Mrs. Kemper. The painting is the final version that Eakins painted to memorialize Rush, the Philadelphia carver who was the first American artist to work directly from the nude model. Other significant acquisitions, by purchase, included *Still Life # 12* by Tom Wesselmann; *Landscape, Cornish, New Hampshire* by John White Alexander; *Alabama Wall I* by William Christenberry; *Children Burying a Bird* by J. Alden Weir; *A Greater Morning* by Arthur B. Davies; and the glass *Opalescent Red Crown* by Harvey Littleton for the Renwick Gallery collections.

The museum continued to refine the collections by deaccessioning works non-American in origin or that duplicate other items in the collections. Eighteen decorative arts objects, fifty-six sculptures, and two period rooms were approved for deaccessioning by the NMAA Commission and other Smithsonian authorities.

The year had moments of joy and sadness with Adelyn Dohme Breeskin, the museum's senior curatorial advisor who had been a member of the staff for twenty-two years. In July the museum organized a surprise ninetieth birthday party for its beloved "Mrs. B." Mrs. Breeskin's career included a curatorship at the Metropolitan Museum of Art and the directorship of the Baltimore Museum of Art. She had received innumerable honors, including the Secretary's Gold Medal for Exceptional Service and honorary degrees from several universities. Works of art by Jacob Kainen and James Surls, among others, were presented to the museum's collection as "birthday gifts" in her honor. A little more than a week after the celebration, while traveling in northern Italy, Mrs. Breeskin fell ill and died suddenly. She is sorely missed by her friends and associates throughout the world of art.

National Museum of American History

In fiscal year 1986 the National Museum of American History (NMAH) continued its dedication to the collection, care, study, and exhibition of objects that reflect the experience of the American people. The museum also offered lectures, concerts, publications, and other programs which interpret that experience. Although the museum was forced to curtail elements of all of its operations in the face of severe budget restrictions imposed by the Gramm-Rudman-Hollings Act, it carried forward an ambitious program of exhibitions, scholarship, collecting, public programs, and renovation.

After the Revolution: Everyday Life in America, 1780–1800, the first of the museum's reinstallations of its permanent exhibition galleries, opened to the public in November. The exhibition explores daily life in America just after the Revolutionary War through case studies of three families and three larger communities. The exhibition also includes a Hands-On History Room, a performance area, and two galleries for temporary special exhibitions, currently presenting displays on eighteenth-century ceramics and costume. Organized and written by a team of historians and curators in the Department of Social and Cultural History, this exhibition is among the first to present new historical perspectives on the daily lives of ordinary people in the new nation. Barbara Clark Smith of the Division of Domestic Life wrote a companion volume to the exhibition, *After the Revolution: The Smithsonian History of Everyday Life in the Eighteenth Century*, which explores in greater depth the lives and times of the people and families in the exhibition.

Engines of Change: The American Industrial Revolution, 1790–1860 was scheduled to open in November 1986. The exhibition depicts the evolving industrial society, work culture, and some of the innovations on which the Industrial Revolution was based—new machinery, interchangeable parts, and the factory system. The exhibition features some of the most important artifacts in the museum's collections, such as the Slater spinning frame and the John Bull, the world's oldest operable locomotive. The curators of the exhibition, Steven Lubar and Brooke Hindle of the Department of the History of Science and Technology, have written a major book as a result of their five years of exhibition research. *Engines of Change*, published by the Smithsonian Institution Press, is a comprehensive study of the Industrial Revolution.

The museum celebrated the Festival of India in October 1985 with two exhibitions. *Aditi: The Momes of India* examined the history of money in India from the

sixth century B.C. to the present, and *All Sorts of Painted Stuffs . . . Indian Chintzes and Their Western Counterparts* treated the production of exotic Indian floral-patterned cottons and their arrival and imitation in the West. *Beyond the City Lights: American Domestic Gas Lighting Systems*, which also opened in October, told the story of the widespread use of gas for illumination in rural nineteenth-century America and its decline as a fuel with the coming of the age of electricity.

At Home on the Road: Autocamping, Motels and the Rediscovery of America, which opened in November, explored the enduring American urge to take to the highway without sacrificing the comforts of home and showed how over the years highway travel has become a form of entertainment. *Hollywood: Legend and Reality* came to the museum in April on the first stop of a tour of six American cities. Organized and circulated by the Smithsonian Institution Traveling Exhibition Service, it is the first major exhibition to explore the development of the film industry and its esthetic and cultural impact on American society. *GA 100: The Centenary of the Division of Graphic Arts* opened in May. The exhibition focused on the history of the division, its principal curators, their interpretations of the division's mission, and the effects of their interests and decisions on the nature and growth of the collections.

Opening in June, *Patent Pending: Models of Invention* paid tribute to American ingenuity in a display of more than 100 patent models, including the Otis brothers' elevator, George Corliss's compound steam engine, and Abraham Lincoln's device for buoying vessels over shoals. The models illustrate the eagerness of nineteenth-century Americans to capitalize on new ideas, build new machines, and mechanize American life. *Invention and Enterprise*, a companion exhibition, displayed objects ranging from a cotton gin to a walking robot that represented critical points in the development of an idea into a successful commercial product. Both shows commemorated the 150th anniversary of the 1836 Patent Act and helped launch the joint Smithsonian Institution–U.S. Patent Model Foundation campaign to raise \$20 million for acquiring some 100,000 patent models scattered across the country and to build a facility to house them. *Body Imaging*, a permanent exhibition that also opened in June, features early versions of the machines used today in three of the most important new techniques of medical diagnostics—ultrasound, CAT (Computerized Axial Tomography) scanning, and nuclear magnetic resonance scanning.

The last exhibition of fiscal year 1986, *New & Differ-*



The Midnighters—a harmonizing group featuring Hank Ballard—were among the rhythm and blues artists of the 1950s pictured in *Rhythm and Blues: Black American Popular Music, 1945–1955*. This exhibition at the National Museum of American History examined rhythm and blues as an expression of the urban Black community, as a commercial commodity, and as a genre that transformed American popular music. (Photograph courtesy Jack Gibson)

ent: *Home Interiors in 18th-Century America*, complemented the first, *After the Revolution*. Opening in August, *New & Different* explored changes in the way Americans furnished their houses and considered important new ideas about luxury and necessity, comfort and leisure, and gentility and social ritual reflected in these changes. The museum continued its popular Case of the Month series, which included displays on the consumer movement in America, American motorcycles and motorcyclists, the history of women's gym suits, and the history of plastic surgery.

In addition to researching, writing, and organizing exhibitions, the two major curatorial departments of the museum moved ahead with the work of investigating American history, publishing articles, augmenting the collections, and sponsoring and attending scholarly symposia, conferences, and lectures.

The Department of the History of Science and Technology continued to publish *Technology and Culture*, the scholarly journal of the Society for the History of Technology. Departmental staff members also helped support the scholarly journals *Railroad History* and *Industrial Archaeology*. Deborah Warner of the Division of Physical Sciences led the inauguration of *Rittenhouse*, a journal treating American scientific instruments and their mak-

ers. Pete Daniel of the Division of Agriculture and Natural Resources received the Herbert Feis Award of the American Historical Association for his book *Standing at the Crossroads: Southern Life in the 20th Century*, and John H. White of the Division of Transportation published *The Great Yellow Fleet: A History of American Refrigerator Cars*.

Scholarly Studies Grants were awarded to Carlene Stephens and David Todd of the Division of Engineering and Industry for study of the relationship of scientific instrument makers to academic astronomers; to Paul Forman of the Division of Electricity and Modern Physics for his research in the military background of atomic clock development; and to Barbara Melosh of the Division of Medical Sciences to support her investigation of gender issues in public art of the New Deal.

A permanent American Indian Program located in the department was established in fiscal year 1986 to bring American Indian perspectives to all of the museum's outreach and exhibition projects, an important development for both the museum and the Institution. Discussions with the National Museum of Natural History subsequently resulted in the initiation of a joint program on American Indian issues at the two museums.

The Information Revolution, a planned major reinstallation on the history of computers and communications, achieved half of its fund-raising goal of \$4 million from a consortium of computer manufacturers and communications firms. *A Material Culture*, a reinstallation planned for 1988, received a large additional grant for its related public programs from the Du Pont Company. *Engines of Change* received a grant for public outreach from the Norfolk Southern Company, supplementing the company's grant last year to help fund construction of the exhibition. The Kellogg Foundation also granted funds for an exhibition on the human and agricultural impact of genetic engineering.

Significant acquisitions include cadet uniforms worn by Jane P. McKeon, in 1980 the first woman to graduate from the U.S. Military Academy at West Point; a laser eraser, donated by Arthur L. Schawlow, who shared the Nobel prize in physics in 1951 for his work in laser spectroscopy; a 1923 "Indian" touring motorcycle with a sidecar; a brass surveying instrument dating from about 1735; an International Harvester 1486 farm tractor, made in 1979; and two eighteenth-century tall case clocks made by Peter Stretch and David Rittenhouse, now the oldest American clockwork pieces in the museum collection.

After five years of work culminating in the museum's



The graphic arts exhibition in the 1920s—when it was located in the Commons of the Smithsonian Building—is one of the images exhibited in *GA 100: The Centenary of the Division of Graphic Arts* at the National Museum of American History.

first major reinstallation, *After the Revolution*, the Department of Social and Cultural History turned its attention to its second major reinstallation project. Scheduled to open in 1989, the exhibition will address the rise of middle-class culture in nineteenth-century America; explore the daily lives of Americans, both in and outside the middle class; and examine the effects of middle-class ideology on people and institutions.

The new Afro-American Index Project, begun in December 1985, has recorded more than 20,000 Afro-American related objects, photographs, and documents in the collections of NMAH and the Anacostia Neighborhood Museum. The project raised sufficient funds to allow it to survey the collections of the National Museum of Natural History, the National Air and Space Museum, the National Portrait Gallery, and the Smithsonian Archives. The Smithsonian Ethnographic Judaica Project, established in fiscal year 1986, began cataloguing the roughly 1,000 ethnographic objects, historical documents, and examples of ceremonial art in the Judaica collections of the Smithsonian to make these resources available for study and interpretation, to the enrichment of both scholars and the general public. Publications and exhibitions will follow the cataloguing phase of the project.

The Division of Political History conducted a survey of the labor history materials at the museum as part of

planning for a 1987 exhibition, *Symbols of Labor*. In conjunction with the opening of the special exhibition gallery on eighteenth-century costume in *After the Revolution*, the Division of Costume hosted a meeting of the Costume Society of America. The Division of Photographic History completed work on a finding aid to the 3,300 images in their collection of photographs by Rudolf Eickemeyer, an outstanding pictorialist photographer of the early twentieth-century.

Many curators and specialists in the department gave lectures this year, including John Edward Hasse, "The Impact of Ragtime in American Culture," at the Scott Joplin Festival; Rita J. Adrosko, "Designing Machine: The Jacquard Loom," at the Wadsworth Atheneum; Carl Scheele, "The Museum and Popular Culture," at the Popular Culture Association's annual meeting; and Gary B. Kulik, "The Invention of New England," at the Center for the Study of New England Culture, University of Massachusetts, Amherst.

New accessions include a fine collection of about 100 pieces of eighteenth- and nineteenth-century American pewter representing the work of major American craftsmen; a trumpet owned and played by John Birks "Dizzy" Gillespie; a Xerox 914 copier, the first fully automated electrostatic office copier; and a large collection of pottery, tools, photographs, and factory records from the Bennett family of Baltimore potters, 1846–1965, among the oldest and most influential American potteries.

The Department of Public Programs continued to provide expanded educational services and to produce several series of programs and concerts designed to bring the public closer to the museum's collections and exhibitions. In the Hands-On History Room, a learning facility for family groups in *After the Revolution*, the education division staff evaluated and fine-tuned its activities while serving visitors. The division has been developing a similar activity center for the *Engines of Change* and continues to operate three other demonstration centers in the museum. The division also oversees the activities of 200 volunteer docents, who conducted tours for 117,000 visitors this year. Striking out in new directions, the division drew on materials used in new exhibitions to develop three curriculum kits for elementary and secondary American history courses. The division also launched an audience research program designed to elicit demographic information about museum visitors.

The department's Program in Black American Culture presented combined colloquia and concerts on Classic Gospel Song, which explored the music of Thomas A. Dorsey, and Black American Popular Music, which ex-

amined the evolution and dissemination of the rhythm and blues style. The program also produced a ten-part Jazz in the Palm Court series and commemorative programs for the Juneteenth Festival and International Women's Day.

The Chamber Music Program, which comprises the Smithsonian Chamber Players, the Smithsonian String Quartet, and the Smithsonian Chamber Orchestra, presented thirty-two concerts at the museum. Reaching for a wider audience, the Chamber Orchestra also released its six-record and five-cassette Mozart series through the Smithsonian Institution Press.

The department continued to present the Saturday After Noon series; its annual Holiday Celebration; the Music: An American Sampler series; the Palm Court Cameo series; and the America on Film series, a free film theater co-sponsored by the Smithsonian Institution Women's Committee and the Resident Associate Program; it also began a new program of performances and craft demonstrations related to *After the Revolution*. Unfortunately, an unexpected reduction in federal funding in mid-fiscal year resulted in the cancellation of a number of late spring and early summer programs.

The museum continued the implementation of its Master Coordination Plan to completely retrofit its mechanical system—including heating, ventilating, air-conditioning, and fire suppression—and to integrate all these changes with the demands of current and future exhibition programs. In concert with this planning and in response to a severe shortage of storage space and persistent asbestos contamination problems, the museum is continuing work on its Master Space Plan, which seeks to anticipate and prepare for the museum's space needs over the next twenty years.

In addition to organizing writing, designing, and producing the exhibition *Aditi: The Monies of India* and creating a booklet and poster to accompany the exhibition, staff members of the National Numismatics Collection created two traveling exhibitions last year. The first displayed rare proofs of Mexican bank notes and ancient Greek coins; the second featured photographs of extremely rare coins, paper currencies, and medals. Staff members and volunteers at the collection published sixteen articles during the year. Through grants awarded by the Research Opportunity Fund three curators—including Dr. Richard G. Doty, a new staff member formerly of the American Numismatic Society—participated in the International Numismatic Congress in London in September. The reorganization of the collections proceeded apace in the U.S. coin collection, which is virtually com-

pleted, and in the ancient Greek coin collection and the section of certified proofs of national bank notes. Eighty-nine accessions during the year added 2,230 new objects to collections, including more than 50 rare ancient Greek silver coins and 147 eleventh-century Islamic gold coins struck in Sicily.

The National Philatelic Collection celebrated its centennial in 1986, and the U.S. Postal Service issued a special booklet of stamps to commemorate the event. An exhibition in the Hall of Postal History and Philately traced the history of the collection, and Executive Director Herbert R. Collins published an article on the collection in *The American Philatelist*. *Reaching Rural America* opened in April. The exhibition traced the introduction and growth of rural free delivery service in the United States and showed how RFD helped diminish some of the isolation and loneliness of rural life. Staff members organized nine smaller exhibitions, including *The Perils of the Posts*, which treated robberies, shipwrecks, and airmail crashes; *Gotcha*, on the Postal Inspection Service, the country's oldest consumer protection agency; and *American Postal Marking Devices*. James H. Bruns, curator of U.S. Postal History and Philately, developed a learning center in the Dillsburg Post

A clockwork mechanism propels this 1871 patent model of an "Improved Creeping Baby Doll." The doll was one of more than a hundred patent models on display in *Patent Pending: Models of Invention*, an exhibition at the National Museum of American History that commemorated the 150th anniversary of the 1836 Patent Act.



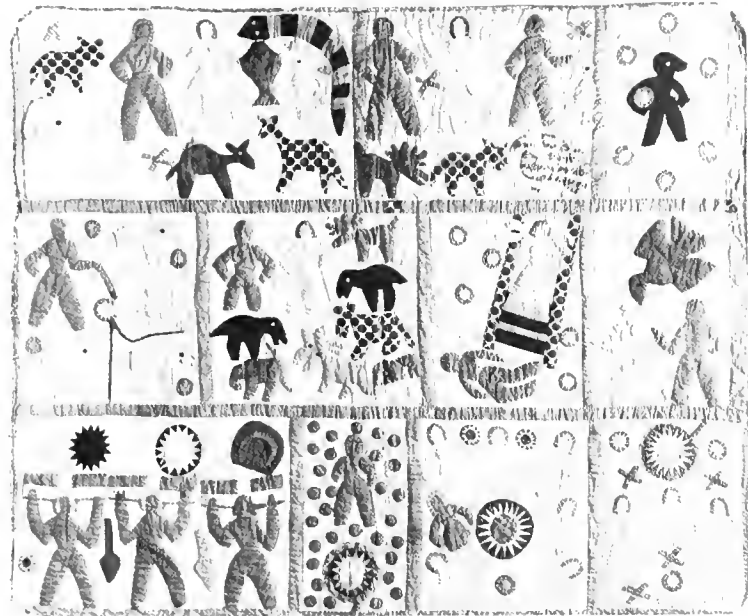
Office display to demonstrate the processing of mail. This year's accessions totaled 90,000 objects, among them a 1775 letter with the earliest known "Constitutional Postmark" and a collection of mint and used Swiss postage stamps, 1843 to 1979.

At the Office of the Registrar, a major portion of the year was spent analyzing space needs for new collections, exhibition reinstallations, and relocation due to renovations planned for the next five years. The museum also began work on plans for moving over 100,000 objects to the Museum Support Center in Silver Hill, Maryland, and appointed a move coordinator under the Office of the Registrar.

The Smithsonian's largest asbestos abatement project affects more than 1,000,000 NMAH objects stored in several buildings at Silver Hill. Registrarial staff cleaned several thousand objects during the year and improved the accessibility of objects for study and exhibition. Staff members supported the receipt and processing of more than 45,000 new acquisitions and 3,000 loans for special exhibitions. The museum lent more than 2,600 objects to institutions in thirty-two states and three foreign countries. Assistant Registrar Katherine Spiess taught a collections course at George Washington University; Registrar Martha Morris led a workshop on Legal Problems of Collections Management for the Virginia Association of Museums and ended her eighteen-month tenure as chair of the Smithsonian Registrar's Council with a special commendation from the Secretary.

Several major developments marked the fourth year of the Archives Center. Most dramatically, the center more than doubled the size of its third floor facility, creating new public service, processing, and collection storage areas, and consolidating all Archives Center staff offices and researcher services in a single location. The center's Modern Advertising History Program received grants of \$90,000 from Philip Morris and \$75,000 from Miles Laboratories to conduct oral history interviews and collect print and electronic advertisements documenting the Marlboro cigarette and Alka-Seltzer advertising campaigns. Archives Center historian Spencer Crew is curator of a major exhibition, *Field to Factory: Afro-American Migration 1915-1940*, scheduled to open in February 1987. A grant from Pepsi-Cola Company of \$80,000 will enable Crew to produce an extensive educational program, including slide-tape presentations, an educational booklet, and a self-guided tour.

The Archives Center has established an audiovisual archives capacity and can now create master and user copies of recordings to allow viewing of films without



This Bible Quilt was made by Harriet Powers (1837-1911), a Black farm woman from the outskirts of Athens, Georgia. The quilt, now in the collection of the Division of Textiles at the National Museum of American History, records the maker's impressions of the Old and New Testaments.

risking damage through ordinary film projection. Chadwyck-Healey, Ltd. produced the center's first microfiche publication, *The Scrapbooks of Joe Louis: 1935-44*, on 304 microfiche cards. A 295-page guide to the Donald Sultner-Welles photographic collection has also been completed. The center also has added some forty-five collections to its holdings.

The Division of Conservation emphasized projects to reduce the immense backlog of objects that need improved storage or basic stabilization treatment to ensure their value for future research or exhibition. More than 3,500 high-priority objects were treated or rehoused during the year, but the total fell short of expectations owing to Gramm-Rudman-Hollings budget restrictions on expenditures for supplies, conservation technician contracts, and staff vacancies. Major collections given such attention included over 1,100 glass photographic plates and cyanotype prints in the Eadweard Muybridge collection; 300 regimental flags of the Civil War and the Spanish American War; and more than 1,000 photographs documenting life in a Kentucky coal mining company town between 1911 and 1940.

Major exhibitions, Cases of the Month, loans, and assistance to exhibits staff required more than 4,700 work hours. The division's rapidly growing Wang data base program helped mesh the complex schedules of conservators, contractors, interns, and volunteers with the flow of hundreds of objects having different treatment needs, priorities, and deadlines. Division of Conservation staff answered more than 600 requests for information from the public and other institutions, and conducted laboratory tours for more than 500 individuals.

At the Computer Services Center, the Museum Automation Program continued to grow through the extension of the local area network, the acquisition of additional workstations and microcomputers, and the addition of memory and on-line storage devices for the central museum computer system. Communications links were established with the Institution's IBM and Wang systems to provide future access to the Collections Information System and electronic mail and document interchange services. Major software acquisitions included the Registration Transaction Tracking System; a minicomputer-based electronic spread sheet and modeling system; the software to support museum and Institutional electronic mail, calendar, and document transfers; and various computer systems management and control applications. The center established a basic and advanced word-processing training program, and welcomed George Seminara, a senior computer specialist, to its staff to plan its software development program and to guide the conversion of the inventory data base.

The Office of the Building Manager has been busy maintaining the building, supporting approximately 1,200 events, and helping to prepare for exhibitions such as *Engines of Change* and *Field to Factory*. The office took the first step toward automation through the addition of a Wang personal computer and printer. The staff continues to support the ongoing asbestos removal at the museum, the long-term Master Space Plan, and in the near future will help in the replacement of the fourth-floor roof, many windows around the building, and the north and south main entrance doors. General Foreman Richard Day was promoted to assistant building manager.

In fiscal year 1986 the Afro-American Communities Project added demographic information derived from records of antebellum Richmond, Virginia, to be analyzed and compared to comparable holdings for northern cities. The project is also attempting to acquire census information for other southern cities from the late-nineteenth century to enlarge its data base and

broaden its holdings beyond the Civil War. Director James Horton presented twelve lectures at universities and to professional organizations, as well as public lectures in Phoenix, Salt Lake City, Albuquerque, and Denver.

The Project on the Vietnam Generation, a private nonprofit organization housed in the museum, celebrated its first anniversary on March 5, 1986. During fiscal year 1986, the project raised \$75,000 to continue its networking and role as a clearinghouse and published a report on its fall 1985 Survey of Courses on Vietnam Era Events as well as four issues of *Report*, the organization's quarterly newsletter. The project's survey of state and local Vietnam veterans' memorials uncovered ninety-six such projects throughout the nation. A report on the survey results was produced by November 1986.

National Museum of Natural History



This mural of the volcanically active Archean World, 3.5 billion years ago, is on view in the National Museum of Natural History exhibition *Earliest Traces of Life*. (Photograph by Chip Clark)

The National Museum of Natural History/National Museum of Man, the nation's largest research museum, houses more than eighty million specimens and artifacts. The one hundred and twenty doctoral-level scientists on the museum staff conduct research on the collections with visiting scholars, students, research associates, and eighty resident scientists from affiliated U.S. government agencies. The results of this research are shared with the public through publications, lectures, and exhibitions.

Dr. Robert S. Hoffmann Named Director

Dr. Robert S. Hoffmann of the University of Kansas, a leading U.S. authority on the systematics and evolution of mammals, was appointed director of the museum in October 1985. Hoffmann is the first non-Smithsonian scientist appointed to the position. At the University of Kansas, Hoffmann served as curator of mammals at the

Museum of Natural History (1968-85), as Summerfield Distinguished Professor of Systematics and Ecology (1982-85), and as dean of the College of Liberal Arts and Sciences (1978-82).

Hoffmann's continuing research focuses on mammalian evolution in the last several million years, in what is now the Bering Strait and its surrounding land formations. He has made many research trips to the Soviet Union and has served on the U.S.-U.S.S.R. Joint Commission on Science Policy of the National Academy of Sciences and the NAS Advisory Committee on the U.S.S.R. and Eastern Europe.

International Grass Symposium

The Smithsonian grass herbarium, containing more than 250,000 specimens, is the largest and most significant in existence. To summarize recent research developments,

identify new problems, and suggest new avenues of approach, the museum in 1986 organized the first international symposium on grass systematics and evolution, held July 27–31 under the sponsorship of the Smithsonian, the American Institute of Biological Sciences, and the National Science Foundation. Museum botanist Dr. Thomas Soderstrom played a major role in planning the symposium. Attended by 150 scientists from the United States and abroad, major symposium addresses were delivered by Richard W. Pohl, Distinguished Professor of botany, Iowa State University; G. Ledyard Stebbins, Emeritus Professor of genetics, University of California, Davis; and Melvin Calvin, Nobel Laureate Professor of chemistry, University of California, Berkeley. The papers presented at the symposium will be published by the Smithsonian Institution Press.

Cooperative U.S.–Mexican Bee Program

Museum entomologist Ronald J. McGinley and colleague Charles Michener, of the University of Kansas, in 1986 initiated the Cooperative Program on the Mexican Apifauna (Programa Cooperativo sobre la Apifauna Mexicana) involving twenty-five bee specialists and botanists from the United States, Mexico, and Panama. An immediate goal is the production of an illustrated, bilingual key to the genera of Mexican bees. The proposed program would promote the study of Mexican bees by encouraging cooperation between researchers in Mexico and other countries and by aiding in establishing a communication network among interested bee workers and pollination ecologists.

Research on Hydrothermal Vents of the Eastern Pacific

Museum zoologist Dr. Meredith L. Jones is an authority on *Riftia*, the giant vestimentiferan tube worm that is a major faunal constituent of the extraordinary communities living in and around seafloor hydrothermal vents. Since the discovery of these communities a decade ago, Jones has played a major role in classifying vestimentiferans. A symposium volume edited by Jones, providing an overview of research on the hydrothermal vents of the eastern Pacific, was published in December 1985 as *Bulletin No. 6* of the Biological Society of Washington. Jones also reported a new discovery bearing on the question of how a mouthless and gutless adult vestimentiferan ob-

tains the internal symbiotic bacteria from which the worm derives its nourishment. Jones's studies of juvenile vestimentiferan worms revealed at the base of the worm's plume a short-lived, ciliated passageway through which bacteria can pass. This passageway later atrophies, leaving the bacterial symbionts inside the worm.

Plains Indian Publications

Much of our knowledge about the Plains of the United States can be linked with the research of Dr. Waldo R. Wedel, museum archeologist emeritus, and Dr. John C. Ewers, museum ethnologist emeritus. Both published major works in 1986. Wedel's *Central Plains Prehistory: Holocene Environments and Culture Change in the Republican River Basin*, published by the University of Nebraska Press, is the first full-scale review and synthesis of central Plains prehistory, using the Republican River Valley, which cuts through Kansas, Nebraska, and Colorado, as an ideal microcosm of Plains environments. Wedel approaches his subject through the environmental setting, demonstrating how drastic variations in climate and natural setting provoked differing cultural responses in the survival strategies of the human inhabitants. Ewers's *Plains Indian Sculpture: A Traditional Art from America's Heartland*, published by the Smithsonian Institution Press, is the first comprehensive look at Plains Indian sculpture. Unlike other Indian cultures, the Plains Indians rendered nearly all works in miniature, often consisting of carvings on effigy tobacco pipes. Ewers's book demonstrates that the Indians of the North American heartland created an art form comparable to the other great traditions of Native American art.

Handbook of North American Indians

Great Basin, sixth in the Smithsonian's projected twenty-volume encyclopedic *Handbook of North American Indians*, was published in August 1986. The forty-five chapters, written by leading experts, summarize modern knowledge of the environment, prehistory, history, development, cultures, and forms of social organization of the Shoshone, Bannock, Ute, Paiute, Kawaiisu, and Washoe tribes. The volume was edited by Warren L. d'Azevedo. The complete *Handbook* is being published under the general editorship of Dr. William C. Sturtevant.

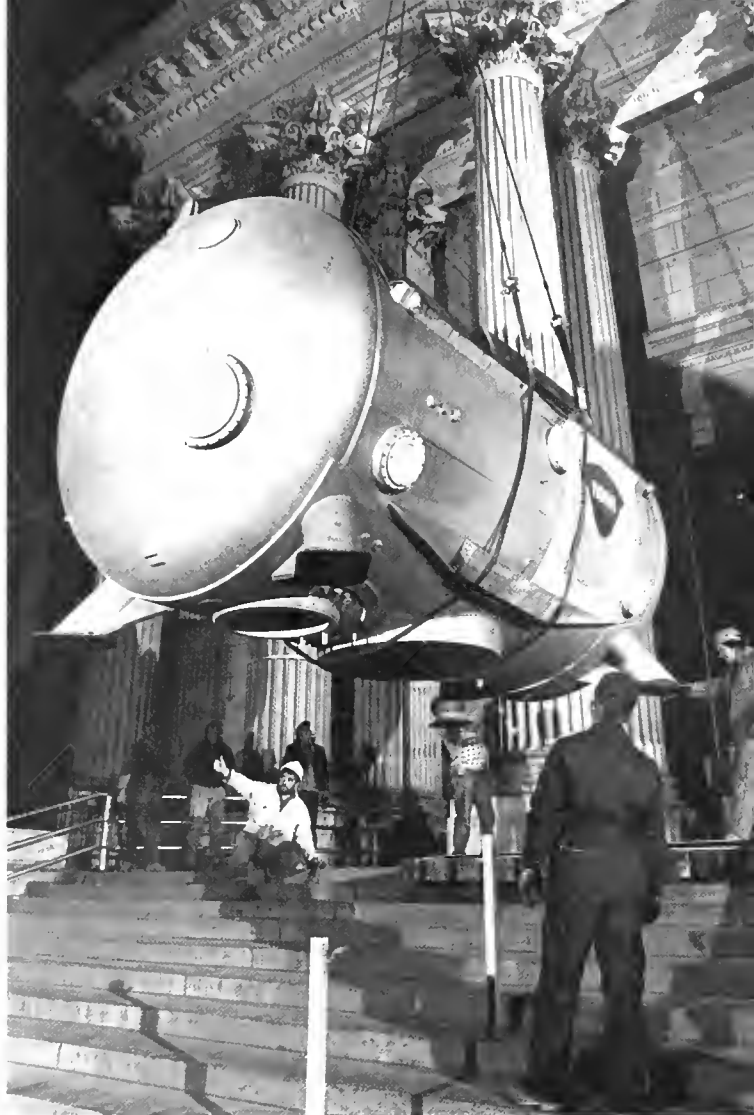
Contributions to Latin American Archaeological Research

Museum archaeologist Dr. Betty J. Meggers was awarded the Secretary's Gold Medal for Exceptional Service in January 1986 for her "innovative research in pre-Columbian archaeology" and her achievements in cementing the professional bonds between the Northern and Southern hemispheres. During her thirty-five years at the Smithsonian, Dr. Meggers conducted archaeological training workshops in Latin America; translated into English many books and articles by Latin American archaeologists; and brought many Latin American archaeologists to study at the Smithsonian under fellowships and grants. She currently directs the archaeological work of the Smithsonian Neotropical Lowland Ecosystems project.

1985–86 International Expeditions

An eruption on the glaciated summit of Nevada del Ruiz in the Colombian Andes in November 1985 destroyed villages and caused the deaths of about 24,000 people. As soon as seismic activity at Ruiz began to subside in late January, a multidisciplinary museum team—headed by Dr. William Melson, a volcanologist, Dr. Vicki Funk, a botanist, and Dr. Gary Graves, an ornithologist—flew to Colombia to study the eruption and its long-term impact on the environment. On the trip Melson amassed samples of the diverse volcanic rocks produced by the eruption. Laboratory studies of the rocks reveal that the eruption tapped largely degassed, highly viscous dacitic to andesitic magma expected to be at the top of a much larger, possibly water-rich magma body, which has yet to erupt.

Dr. Ernani Menez of the museum's Oceanographic Sorting Center in May 1986 led a field party of American and Philippino scientists to Siayan Island, a remote, biologically unexplored offshore area of the northern Philippines, to make collections of marine plants and animals. Eight scientists from the University of California, Berkeley, Scripps Institute of Oceanography, Seattle Pacific University, Mindanao State University, and Silliman University, took part in the expedition jointly funded by the Smithsonian and the National Cancer Institute. Seaweeds and seagrasses possibly containing active natural substances of value as anticancer drugs were collected for research.



Workmen move Hydrolab, the National Oceanic and Atmospheric Administration's underwater research laboratory, into the National Museum of Natural History. (Photograph by Chip Clark)

Hiking into Nepal's mountainous Anapurna region, museum scientists in October 1985 conducted a biotic survey of a proposed Anapurna Conservation area and searched for habitats appropriate for more detailed surveys. Museum arachnologist Jon Coddington, entomologists Jerry Louton and Wayne Mathis, botanist Vicki Funk, ichthyologist Richard Vari, and herpetologist George Zug, accompanied by Nepalese Sherpas and porters, made the trek with the encouragement of World Wildlife Fund and Nepalese government officials interested in the formation of multiuse national parks. The team made recommendations bearing on the conservation of the natural communities in the proposed area.

Moroccan field expeditions were carried out in October 1985 and April 1986 by a Smithsonian-National Geographic Society international team of paleontologists searching for the ancient Strait of Gibraltar—a passage believed destroyed more than five million years ago by

the collision of the European and African continental plates. This project, headed by museum paleobiologist Dr. Richard H. Benson, is providing historical evidence of the formation of the mountain systems of southern Spain and northwest Africa.

Pioneering Bat Study

Tropical bats, nocturnal and elusive, have frustrated efforts of scientists to capture, mark, and monitor them on a long-term basis. It has not been possible to learn much about bat populations, longevity, or behavior. But over the past decade, museum mammalogist Dr. Charles O. Handley developed field techniques that made it possible for him to illuminate the demography and natural history of a population of tropical bats and their important role in tropical forest ecology. For a study site Handley selected Barro Colorado Island, near the Panama Isthmus, where a large pool of bats feed year-round on the fruit of the canopy trees. Through the first half of the project, 1975–80, Handley worked with U.S. Fish and Wildlife scientists Don Wilson and Alfred Gardner. Douglas and Susan Morrison of Rutgers University conducted radio-tracking and related roosting and foraging studies, supported by the Smithsonian Tropical Research Institute and the National Geographic Society. The Smithsonian's National Zoological Park maintained a colony of Panamanian bats in the early stages of the project that were used to determine age structure and reproductive cycles—data of invaluable aid in the field. The field crews caught a total of 48,375 bats, including fifty-six species. Every new bat caught was marked, but the project focused on the common fruit bat, *Artibeus jamaicensis*. As the project progressed, Handley calculated the annual survival rate of the adult female bat to be about 60 percent, the average longevity to be 1.8 years, and the potential longevity to be about 10 years.

Smithsonian Marine Station at Link Port

The Smithsonian Marine Station at Link Port—at the Harbor Branch Oceanographic Institution, Fort Pierce, Florida—presents a unique opportunity to study marine organisms because it is situated in a transition zone between tropical and temperate provinces. Local marine habitats include mangroves, seagrass beds, mud and sand flats, intertidal coquina outcrops, sabellarid worm reefs, oculinid coral reefs, shallow to deep water sandy



On the back of an elephant, National Museum of Natural History entomologists Wayne Mathis and Jerry Louton ride through a field of tall grass in Nepal. They are carrying collecting nets.

plains, and the Florida current with its myriad of tropical plankton and larvae. These environments enable Smithsonian scientists to conduct systematic, ecological, reproductive, and behavioral studies. For example, Dr. M. G. Harasewych is investigating the family Melongenidae with the subfamilies Busyconinae, restricted solely to the east coast of North America, and Melongeninae, found worldwide. For this research he is using DNA-DNA hybridization and isoenzyme electrophoresis techniques to confirm the evolutionary relationships inferred on the basis of shell morphometric and anatomical data. This represents one of the first efforts to use DNA techniques to study molluscan evolution.

Dating the Origin of the Solar System

Meteorite curator Glenn J. MacPherson initiated a major study of the meteorite Vigarano, from Vigarano, Italy.

Vigarano is similar to the Allende meteorite, whose isotopic properties gave the first direct clues to the earliest history of the solar system. Because subsequent modification of the Allende meteorite during later solar system evolution has obscured some of its primary features, scientists have tried to find a similar meteorite that has escaped such modifications. Vigarano is such a meteorite. Using samples from the Vigarano meteorite in the museum meteorite research collection, MacPherson made studies using ion microprobe and scanning electron microscope equipment in the laboratories of collaborating scientists from the University of Chicago and Washington University, St. Louis. Preliminary results have begun to establish the prealteration isotopic and chemical signatures of the earliest solar system solid material.

Mangrove Ecosystem Study

As a result of human activities, such as dredging, sewage dumping, and oil spills, the intertidal environment of many mangrove swamps on tropical and subtropical coasts are under environmental stress. To gather much needed data on mangrove communities, the museum initiated the first long-term multidisciplinary study of an undisturbed mangrove ecosystem at Twin Cays, Belize, coordinated by Dr. Klaus Ruetzler. The study was begun with grants from the EXXON Corporation and now is supplemented with grants and fellowships from the Smithsonian Caribbean Coral Reef Ecosystems Program. Seventy-five scientists from the Smithsonian and other institutions worked at Twin Cays in 1985–86. Among the projects by museum staff are sediment coring and mapping studies by Ian Macintyre; a study of the functional differences between different morphological forms of brown alga by Mark and Diane Littler; an investigation of the physiological adaptations of selected mangrove organisms to salinity and temperature stress by Kristian Fauchald and Brian F. Kensley; surveys of shore fly and beetle fauna by Wayne Mathis and Paul Spangler; a study of copepod parasites of fishes by Roger Cressey; a lichen survey by Mason Hale; and ichthyological studies by James Tyler and David Johnson.

Museum Support Center

The Museum Support Center—located at Silver Hill, Maryland and administered by the museum—is devoted exclusively to collections management. During 1986 a

new storage facility for Antarctic meteorites was completed. Hundreds of meteorite specimens gathered in the Antarctic over the last decade by National Science Foundation expeditions, and temporarily stored at the National Air and Space Administration's Johnson Space Flight Center, are being turned over to the Smithsonian. These and other precious samples from the museum meteorite collection will be permanently stored at the Museum Support Center.

Earth's Oldest Fossils Featured in New Permanent Exhibition

The Earliest Traces of Life opened on June 27. The highlight of the exhibition is a 3.5 billion-year-old stromatolite, fossilized blue-green algae and bacteria, the oldest direct evidence of life on earth. A large mural depicts algal life-forms growing along the shoreline 3.5 billion years ago. Among the other displays are fossil microbes preserved in surprising detail and fossils of the Ediacara fauna, the earliest known multicellular animals, distributed worldwide in rocks between 570 and 670 million years old. Geologist Kenneth W. Towe provided the scientific background for the exhibition displays. An animated film by Faith Hubley, *Enter Life*, shows the critical stages thought to be involved in the establishment of living things on our planet based on Dr. Towe's assessment of possible scenarios and probable hazards early life on earth may have encountered. For his outstanding contributions to the development of *The Earliest Traces of Life* and other paleontology halls, he was presented a Director's Award for exceptional service.

Other permanent exhibitions include *Shark!*, displaying the jaws of *Carcharodon megalodon*, the colossal ancestor of the modern great white shark, opened in the paleontology hall. For this display a set of fiberglass jaws was fitted with a set of forty-eight *C. megalodon* teeth, ranging from 1 to 6 inches in length, donated by Peter J. Harmatuk, a fossil hunter from Bridgeton, North Carolina. Hydrolab, a stationary underwater laboratory that revolutionized oceanographic research by permitting scientists to live and work in the depths of the sea for lengthy periods, was placed on exhibition in the Sea Life Hall on May 15. Underwater photographs and video footage of scientists using Hydrolab are on view. Hydrolab was retired from service in 1985 after serving for nine years as a National Oceanic and Atmospheric Administration undersea base off Saint Croix, Virgin Islands.

Voyage into History

The U.S. Exploring Expedition, a landmark in the annals of science and naval history, triumphed again in 1985–86 as a critically acclaimed Smithsonian exhibition and book. The yearlong exhibition (November 14, 1985–November 9, 1986) commemorated an expedition that made enduring contributions to scientific knowledge. The expedition's most important legacy was the thousands of bird, mammal, fish, coral, and plant specimens and ethnographic artifacts collected by the "Scientifics"—the remarkable young scientists on the voyage. The collections the Scientifics assembled, mostly from the Pacific Islands and the west coast of North America, were without precedent in the country. Turned over to the Smithsonian in 1857, the artifacts became the foundation for the museum's study collections.

Financed by generous grants from the Atlantic Richfield Foundation and the Smithsonian Special Exhibition Trust Fund, *Magnificent Voyagers* became a massive undertaking comprising 1,750 objects, the largest special exhibition ever organized by the museum's Exhibits Office. More than forty institutions and individuals lent materials for the show.

Museum historian Herman Viola played the major role in initiating and coordinating the planning of the event—undertaken for the celebration of the museum's twenty-fifth anniversary. Viola, George Watson, Frederick Bayer, Adrienne Kaepler, Jane Walsh, Daniel Appleman, Richard Eyde, Philip Lundeberg, Harold Langley, Nathan Reingold, Jeffrey Stann, Douglas Evelyn, Joye Leonhart, Ralph Ehrenberg, John Wolter, and Charles Burroughs contributed to the book accompanying the exhibition. The book, edited by Viola and Carolyn Margolis, the exhibition project manager, was published by the Smithsonian Institution Press.

The museum's Office of Education publicized the exhibition through its new quarterly calendar. Teacher kits offering multimedia materials were developed for the exhibition and made available nationally. *Sailing Ships and Old Salts*, a special weekend festival of family activities was organized in conjunction with the exhibition, presenting performances of sea chanteys, Samoan dancers, and demonstrations of the traditional crafts of seamen—scrimshaw, knot tying, flag signaling, and the use of navigation instruments.

Magnificent Voyagers will be circulated nationally for two years by the Smithsonian Institution Traveling Exhibition Service following the engagement at the Smithsonian.

Other special exhibitions include: *Music and Dance of Papua, New Guinea*, (January 10–March 9, 1986), color photographs and artifacts of the brilliantly colorful ceremonial costumes, personal adornment, and dances of the people of Papua New Guinea by photographer Jordan Wright. *Seven Views of Hopi* (March 14–June 1, 1986), photos of the Hopi People by seven Hopi artists. *Fields of Grass* (June 6–August 31) an exhibition of drawings, watercolors, and prints of grasses by artists from the sixteenth century to the present. *The People of China* (September 19–November 9), fifty oil portraits and sketches of China's ethnic minorities by Lunda Hoyle Gill. *Bird Carving in Wood by Ma Hai Feng* (November 1–December 31, 1985). *Antarctic Summer: Watercolors by Lucia de Leiris* (August 8–October 31, 1986). *Thomas T. Thompson Trilobite Collection* (through 1986), the largest and finest personal collection of North American trilobites.

Teacher Workshops

Programs for teachers were a main focus of the museum's Office of Education. Programs and workshops designed to assist teachers in using the museum as a resource for teaching the natural sciences were funded through the Educational Outreach Fund and held in Washington, D.C., and six other cities.

National Portrait Gallery

Two major sculpture exhibitions were highlights of fiscal year 1986 at the National Portrait Gallery. *Gaston Lachaise: Portrait Sculpture* was the first exhibition to concentrate on the major role of portraiture in Lachaise's oeuvre, usually celebrated for the large female portraits for which his wife served as the model.

John Frazee, Sculptor brought together the work of the first American to fashion a portrait in marble and the first to receive a commission from Congress to create a sculpture for the U.S. Capitol. This exhibition was co-organized with the Boston Athenaeum where it was shown after it closed at the gallery.

Davy Crockett: Gentleman from the Cane commemorated the bicentennial of the folk hero's birth. The exhibition included Crockett memorabilia relating to both the man and the myth, first editions of his writings, and the portraits of him by Chester Harding and James Shegogue. Jointly organized by the National Portrait Gallery and the Tennessee State Museum, the exhibition moved to Nashville after its Washington showing.

Portraits by Brady: Imperial Prints from the Harvard College Library was the first museum exhibition devoted to the large format salt and albumen portrait prints that represented the premier product of Mathew Brady's galleries during the Civil War era. The sixty prints exhibited were selected from a collection of almost 500 donated by a Harvard alumnus to the college libraries several decades ago.

Through Light and Shadow: Photographs by Clara Sipprell was an exhibition of twenty-nine portraits selected from some 600 Sipprell photographs donated to the National Portrait Gallery by the estate of Phyllis Fenner, the photographer's longtime companion. The exhibition surveyed the forty years of Sipprell's career.

Artists on Paper displayed portraits of American artists selected from the gallery's collections of prints, drawings, and photographs; *A Decade of Print Collecting: The Highlights* celebrated the ten years of the print department's existence, while portraits acquired by the gallery during 1985 and 1986 were displayed in *Recent Acquisitions*.

The American Art/Portrait Gallery Library participated in the Albert Bierstadt *Choolooke, The Yosemite Fall* exhibition, organized by the Timken Art Gallery, San Diego, by lending the 1872 edition of *The Picturesque America or the Land We Live In*, edited by William Cullen Bryant. In April 1986, the "Edgehill" portrait of Thomas Jefferson by Gilbert Stuart left the gallery for a three-year stay with its co-owners, the Thomas Jefferson Foundation at Monticello. In May the Athenaeum por-



Pictured at the National Portrait Gallery's "Evening with Katherine Dunham," April 10, 1986, are (left to right): Marc Pachter, Assistant Director for History and Public Programs, Katherine Dunham, and Director Alan Fern. (Photograph by Jeff Tinsley)

traits of George and Martha Washington returned to the National Portrait Gallery from Boston and began their three-year residence in Washington.

In fiscal year 1986 the gallery purchased more than 200 works and received approximately sixty gifts. Among the notable painted portraits are those of Talcott Williams by Thomas Eakins, Willard Huntington Wright (S. S. Van Dine) by his brother Stanton MacDonald-Wright, and Thomas Sterns Eliot by Sir Gerald Kelly. Two busts by Jo Davidson, of artist John Marin and labor leader Andrew Furuseth, add to the gallery's substantial holdings of work by this sculptor. Major prints include Peter Pelham's portrait of Cotton Mather, the first engraving made in America; posters of dancers Katherine Dunham and Josephine Baker; Anders Zorn's etching of collector Charles Deering; Mabel Dwight's lithograph of print curator Carl Zigrosser; and Robert Rauschenberg's lithograph of printer and dealer Tatyana Grosman. The gallery also acquired a substantial number of drawings by the twentieth-century caricaturists Henry Major and Herman Perlman. Major photographs include the daguerreotype of Mathew Brady that is the



only authenticated portrait of Brady, and Man Ray's portrait of Gertrude Stein.

The portrait of T. S. Eliot was purchased with the support of the National Portrait Gallery Commission and senior gallery staff in honor of Donald Klopfer, husband of commission member Katie Louchheim Klopfer. A grant from the James Smithson Society assisted with the purchase of the portrait of Willard Huntington Wright. The acquisition of the Talcott Williams portrait was also assisted by the James Smithson Society and the Kate and Laurens Seelye family.

The Catalog of American Portraits—a research center within the National Portrait Gallery—completed a field survey of Texas, New Mexico, and Oklahoma in 1986. Major collections in the University of Pennsylvania and the U.S. Naval Academy were added to the files. The Peale Papers staff continued transcribing, researching, and annotating selected letters and documents of Charles Willson Peale and his artist sons Raphaele and Rembrandt.

Publications produced in connection with exhibitions were: *Gaston Lachaise: Portrait Sculpture*, published with the Smithsonian Institution Press and supported in part by a grant from the Lachaise Foundation; *John Frazee, Sculptor*, published jointly by the gallery and the Boston Athenaeum; *Davy Crockett: Gentleman from the Cane*, a joint publication of the gallery and the Tennessee State Museum; and a brochure for *Through Light and Shadow: Photographs by Clara Sipprell*. The gallery's general information brochure was redesigned and reprinted this year with funds provided by the T. M. Evans Foundation, Inc.

Exhibitions and permanent installations were accompanied by programs organized by the Education Department as diverse as a film series highlighting The Friends of Gaston Lachaise; Lunchtime Lectures offered by the curators; and a Cafe Concert highlighting the gallery's prized portrait of Mary Cassatt by Edgar Degas. Noteworthy this year was a lecture by the eminent British author Nigel Nicolson on the special bonds between American and English cultures at the turn of the century, saluting the National Gallery's *Treasure Houses of Britain* exhibition, and a presentation by American author

Garry Wills on the imagery of George and Martha Washington, in honor of the return of the portraits to the gallery—both cosponsored by the Smithsonian Resident Associate Program. Also complementing the *Treasure Houses* exhibition were Lunchtime Lectures, "The English Connection: America's Lingering Ties of Affection with Great Britain" and "The English Accent in American Portraiture." The Education Department continued its Portraits in Motion series, providing theatrical portraits of such figures as Thomas Jefferson and Paul Robeson, and inaugurated such new programs as an American storytelling series and the presentation of *Hughie*, a short play by Eugene O'Neill, performed in American Sign Language by a member of the National Theatre of the Deaf.

After a one-year hiatus, the gallery reinstated the Living Self-Portrait series of interviews with notable Americans, beginning with an evening with philosopher Mortimer Adler, cosponsored by the National Museum of American Art, followed in the spring by an evening with distinguished ethnographer and dancer Katherine Dunham.

The purchase of this oil-on-canvas portrait of T. S. Eliot by Sir Gerald Kelly for the National Portrait Gallery was made possible by the generosity of the National Portrait Gallery Commissioners and senior staff in memory of Donald Klopfer. (Photograph by Eugene Mantie)

Office of Exhibits Central

The Office of Exhibits Central (OEC) continues to reflect the diversity of the Smithsonian by providing specialized exhibit and exhibit-related services for nearly all of the Smithsonian museums and bureaus. The over 200 projects completed each year support research, public information, as well as exhibit and exhibition efforts throughout the Smithsonian.

For the National Museum of American History's exhibition *Engines of Change*, the OEC Model Shop prepared six all-white mannequins, which demanded extraordinary attention to surface texture and detail. Life masks, hands, and most of the clothing were made at the office.

For the National Museum of Natural History, the Model Shop made casts of several specimens for scientific study; among them were three very detailed epoxy resin casts of a jade Tuxtla statuette. The Model Shop also produced replicas of Eskimo snow goggles and a doll for the Discovery Room, and the office's editorial staff provided assistance for the *Antarctic Summer* exhibit.

For the Smithsonian Institution Traveling Exhibition Service alone, the office produced twenty new exhibits. One of the most comprehensive was *Community Industries of the Shakers: A New Look*, for which the office designed the exhibition, edited the script, fabricated eleven freestanding custom-built exhibit cases and fifteen platforms with back walls, silk-screened over thirty-five didactic panels and individual labels for each of the 250 artifacts, and packed the entire exhibition in thirty-eight custom-made shipping containers. *Art Nouveau Bing: The Paris Style 1900* was another large exhibition for SITES, composed about 200 artifacts (furniture, textiles, ceramics, and works on paper) from collections in France, Germany, Scandinavia, and the United States. This exhibition, like the Shaker exhibition, required the efforts of all OEC units.

A brief list of other projects completed in fiscal year 1986 will illustrate the variety of tasks handled by the office each year: the *Discover Graphics* exhibit for the Smithsonian Resident Associate Program; the *Poster Contest* exhibit for Reading Is Fundamental; twenty to thirty Plexiglas book stands for the Dibner Library; exhibit vitrines for the National Portrait Gallery and the Hirshhorn Museum and Sculpture Garden; fiberglass casts of three tombstones for the *John Frazee* exhibition at the National Portrait Gallery; an exhibit about the orchid collection for the Office of Horticulture; graphics for the Folklife Festival; a variety of support for the Christmas Dance and Craft Show organized by the

Women's Committee of the Smithsonian Associates; and a planning model of the Castle for the Visitor Information and Associates' Reception Center.

Of special note in fiscal year 1986 was the retirement of three longtime Smithsonian employees at OEC. William Clark, OEC administrative officer, retired after twenty-two years at the Smithsonian. John Widener, who came to the Institution in 1957 as a plastics consultant, retired as chief of production. And James A. Mahoney, director of OEC since 1974, retired after twenty-eight years at the Smithsonian.

Office of Horticulture

During 1985, the Office of Horticulture completed a reorganization, and strengthened the ability to provide a full range of horticultural services to the bureaus, to manage the grounds of all museum facilities, and to develop educational outreach programs.

To prepare for the opening of the quadrangle, the existing greenhouses were reorganized, and two additional houses were purchased. Throughout the year, the office supervised the selection and delivery of trees, and the restoration of the important collection of garden furnishings to be installed in the Enid A. Haupt Garden. During the course of the year, director James R. Buckler and museum specialist Mrs. Kathryn Meehan, on behalf of the Secretary, kept Mrs. Enid A. Haupt informed on the progress of the installation of plants and furnishings for the new garden, named in her honor, scheduled to open in spring 1987. Coordination was begun with the Office of Exhibits Central on the design of an exhibition pre-viewing the garden.

Mr. Kenneth Hawkins, Grounds Management Division foreman, continued to oversee the grounds and their plant collections. Special projects included the design and installation of landscaping at the Anacostia Neighborhood Museum Annex, replanting the Ninth Street perennial border, continued refinement of the plantings and their labeling in the Fragrant Garden, and the installation of over 16,000 pansies, 45,000 spring bulbs, and 35,000 annuals.

Mr. August Dietz, Greenhouse Nursery Division manager, supervised the production of over 70,000 annuals; the management of permanent collections of over 30,000 orchids, 250 bromeliads, and 110 ivies; rotation of over 4,500 tropical plants, assembly and delivery of 384 floral arrangements and 3,000 potted plants for special events, and computer input of over 11,000 data entries. The addition of over 2,850 volunteer hours and the assistance of interns permitted the Greenhouse Nursery Division to complete its work with limited manpower resources.

A grant of \$15,000 from the James Smithson Society will be used to document images of gardens for preservation on a laser disc. The first collection to be treated will be the *Slide Library of Notable American Parks and Gardens*, assembled by the Garden Club of America. A \$3,000 gift from the Women's Committee of the Smithsonian Associates funded a gardener's internship to maintain the Fragrant Garden.

Five interns participated in the office's 1986 summer internship program. Educational outreach programs included the ninth annual *Trees of Christmas* exhibition, which displayed thirteen new collections of ornaments.



"Nature's Bounty" was one of the trees in the *Trees of Christmas* exhibition held at the National Museum of American History, December 20, 1985, through January 6, 1986.

Dixie Rettig, an office volunteer, assisted Lauranne C. Nash with its coordination. Over 1,200 volunteers created the 4,600 ornaments. Barbara Restum, Jane Cronin, and Bonnie Hooker also helped with the installation.

Grasses of the World was developed with the Department of Botany, and *Tropical Plants for Indoor Use* with the Department of Exhibits, National Museum of Natural History. Two exhibitions of orchids at the Maryland Orchid Society Show took first place for the best *Phalaenopsis* and second place for best display; and at the National Capital Orchid Society Show, the office installed an exhibition of specimen orchids and an educational display, mounted by the Office of Exhibits Central.

The film *Horticulture in a Museum Setting* was produced with the Office of Museum Programs, narrated by Mr. Buckler.

Office of Museum Programs



Laura Schneider of the Office of Museum Programs is seen in the center of activity during a filming production of an Office of Horticulture project.

The Office of Museum Programs (OMP), directed by Jane R. Glaser, continued to offer programs of training, services, information, and assistance through workshops, the Native American Museums Program, the Audiovisual Program, internships, the Visiting Professionals Program, the Kellogg Project, the Museum Reference Center, and the Awards for Minority Museum Professionals.

The workshop series included thirty courses on topics of museum operations and were offered at the Smithsonian, utilizing Institution staff as well as outside experts. Fifteen on-site workshops were given in collaboration with regional, state, and national organizations. Highlights for 1986 included a joint OMP/African American Museums Association on-site workshop for teams of museum directors and trustees, supported by the Smithsonian Education Outreach Funds, and the conference on "Women's Changing Roles in Museums," cosponsored by the Smithsonian Institution Women's Council.

The Native American Museums Program continued to support this special constituency through on-site activities and through a publications exchange program. Highlights included the Native American Archives Advisory

Conference to assess needs and recommend actions to preserve documentary heritage, and the Design and Production of Exhibitions Project, made up of three components: workshop, practicum, and evaluation.

The Audiovisual Program continued to provide videotape and slide programs, for loan and sale, on topics such as preventive care of collections, education, security, museum careers, and folk life. A new film on historic house museums, *A Living Legacy: The Woodrow Wilson House Museum*, was completed. Several projects initiated in 1986 explored topics such as museum lighting; conservation in art museums; film/videotape productions on "Horticulture in a Museum Setting," produced in collaboration with the Office of Horticulture using Education Outreach Funds; and learning in museums with the Kellogg Project.

The internship program placed more than 125 people throughout the Institution, including fifty-eight students from the District of Columbia Multicultural Bilingual High School into Junior Externships.

The Visiting Professionals Program continued to meet the needs of more than 169 museum professionals through short-term appointments. Itineraries for visits to museums throughout the United States were arranged upon request. In collaboration with the U.S. Information Agency, the office held three thirty-day group visits to bring twenty-eight outstanding museum leaders and specialists from abroad to share and consult with American colleagues on issues such as museum management and education.

The Museum Reference Center, a branch of the Smithsonian Institution Libraries, answered more than 2,500 inquiries for research information on museum issues. Thirteen new bibliographies were prepared—bringing the total available to seventy—providing up-to-date information on museum ethics, technology and computers in the museum environment, and museum management.

The Kellogg Project received a second three-year grant to expand the educational influence of museums nationally. Highlights for fiscal year 1986 included the International Congress on Learning in Museums, sponsored with the Indianapolis Children's Museum, and two groups of residencies for Museum Professionals at the Smithsonian.

The Awards for Minority Museum Professionals supported \$500 grants to twenty-six individuals so that they could attend a workshop of their choice. In addition, each recipient was able to spend a week in residence at the Institution as a visiting professional.

Office of the Registrar

During fiscal year 1986, Mary E. Case became the new director of the office following Philip Leslie's retirement. Ms. Case came to the Institution with experience in history, art, and scientific collections; permanent and traveling collections; and automation and project management. Ms. Case hired Joseph L. Wiley from the National Museum of American History to assist her.

The office began to assume expanded responsibility for oversight of Institution-wide collections management issues. The oversight and governance of the automated Collection Information System (CIS) has taken priority. Every bureau of the Smithsonian is involved in the project through representation on the governing CIS committee and through constant interaction with the Office of Information Resource Management which maintains the central computing facility.

Working with the Office of Museum Programs (OMP), the office established a program to restructure several annual workshops produced by OMP. Workshop topics include registration methods; storage and handling; developing, managing, and maintaining collections; and computers in collections management and research.

The office continues its involvement in collections management policy development and oversight, as well as in Institution procedures for accessions, cataloguing, and deaccessions.

A new vitality instilled into the Registrar's Council increased its visibility, voice, and enthusiasm. Monthly programs included informational sessions on repatriation of cultural property, training programs, legislative developments, risk management, and museum ethics.

Smithsonian Institution Traveling Exhibition Service



Peggy A. Loar, director of the Smithsonian Institution Traveling Exhibition Service, and (to her right) Zachary Morfogen, director of Corporate Cultural Affairs for Time Inc., greet guests at the opening of the exhibition *Hollywood: Legend and Reality* in April 1986.

For the Smithsonian Institution Traveling Exhibition Service (SITES), 1986 was dominated by the final production phases and opening installations of *Hollywood: Legend and Reality* at two Smithsonian museums. The exhibition was made possible by the generous support of Time, Inc. For the April 1986 opening at the National Museum of American History, SITES staff collected more than 400 objects; arranged for exhibition design and, with the Office of Exhibits Central, for exhibition production; assisted the Smithsonian Resident Associate Program and the American Film Institute Theater with planning of public programs; published an accompanying book with New York Graphic Society; prepared and published the gallery brochure; and worked with Acoustiguide to prepare the audio tour. The exhibition was viewed by 212,000 people in Washington. Following the New York showing at the Cooper-Hewitt Museum, the exhibition will travel to four U.S. cities.

Renaissance Master Bronzes, consisting of seventy-five works from the Kunsthistorisches Museum, Vienna, opened its limited tour at the National Gallery of Art. The exhibition catalogue was published with Scala Books. And *Art Nouveau Bing: The Paris Style 1900* began its tour to Richmond. Gathered from public and private collections in Europe and America, the exhibition

documents new research of Siegfried Bing's role in the development of twentieth-century decorative arts. Guest curator Gabriel Weisberg's extensive findings are further presented in the book *SITES* copublished with Harry N. Abrams.

Swiss connoisseur Samuel Josefowitz made his extensive collection available for a U.S. and an international tour of *Gauguin and His Circle in Brittany: Prints of the Pont-Aven School*, which opened at the Rijksmuseum Vincent Van Gogh in Amsterdam. *The Master Weavers* was prepared as part of the Festival of India celebrations. *Haiti: The First Black Republic and Its Monuments to Freedom* was conceived as part of the Quincentennial observances. Spectacular and unusual materials for the study and appreciation of diverse cultures marked the content of *Treasures from the Land: New Zealand Craftsmen and Their Native Materials* and *Treasures of Hungary: Gold and Silver from the Ninth to the Nineteenth Century*.

SITES collaborated with other museums to present *American Master Drawings: Selections from the Corcoran Gallery of Art*, *Anasazi World* (Maxwell Museum of Anthropology, University of New Mexico), *Mark Twain and Huck Finn: Joy-Flags and Milestones* (Mark Twain Memorial with National Geographic), and *Contemporary Print Images: Works by Afro-American Artists from the Brandywine Workshop*. Additional offerings in Black studies included Anacostia Neighborhood Museum's revised version of *Black Women* and a new panel exhibition based on *The Art of Cameroon*, a *SITES* international loan exhibition.

With the Hirshhorn Museum and Sculpture Garden, *SITES* organized *Surrealist Art*; with the National Museum of American History, *After the Revolution* and *Eleanor Roosevelt*; and with the National Museum of Natural History, *Drawn from the Sea*.

SITES exhibitions were hosted by a range of foreign cities. *Ban Chiang: Discovery of a Lost Bronze Age* was shown at the National Museum of Singapore before its permanent installation in Ban Chiang, Thailand. *Recent American Works on Paper* was shown in New Delhi, India, under the auspices of the U.S. Information Agency. *Mouton Rothschild: Paintings for the Labels* traveled to the Victoria and Albert Museum in London; *An Age of*



This exquisite bronze statuette, *Venus Urania*, 1573, by Giambologna (1529–1608), is part of the *SITES* exhibition *Renaissance Master Bronzes from the Collections of the Kunsthistorisches Museum, Vienna*.

Gold: Three Centuries of Paintings from Old Ecuador to San Juan, Puerto Rico; Jamaican Art traveled to Port-au-Prince, Haiti; and *The Artist and the Space Shuttle* was shown in Tokyo.

Russia: The Land, the People 1850-1910 opened in October 1986 at the Renwick Gallery, marking the first exhibition exchange with the Soviet Union since the signing of a cultural agreement in November 1985. As part of the exchange, SITES organized *New Horizons: American Painting 1840-1910* for tour in the Soviet Union.

Exhibitions Beginning Tours October 1, 1985, through September 30, 1985

After the Revolution: Everyday Life in America, 1780-1800

American Master Drawings from the Corcoran Gallery of Art

Anasazi World

Art Nouveau Bing: The Paris Style 1900

The Art of Cameroon Grassfields

Black Women: Achievements Against the Odds

Carnegie Libraries: A Sesquicentennial Celebration

Community Industries of the Shakers

Contemporary Print Images: Works by Afro-American Artists from the Brandywine Workshop

Drawn from the Sea: Art in the Service of Ichthyology

Eleanor Roosevelt: First Person Singular

European Illustration: 1974-1984

Five Centuries of Italian Textiles

French Cinema Posters, 1924-1939: The Art of Jean A. Mercier

Gauguin and His Circle in Brittany: Prints of the Pont-Aven School

Haiti: The First Black Republic and Its Monuments to Freedom

Hollywood: Legend and Reality

John Held's America: Flappers, the Jazz Age, and Beyond

Mark Twain and Huck Finn: Joy-Flags and Milestones
The Master Weavers

Out of Africa

Renaissance Master Bronzes from the Collections of the Kunsthistorisches Museum, Vienna

The Santa Fe Trail Series: Photographs by Joan Myers

Surrealist Art: Selections from the Hirshhorn Museum and Sculpture Garden

Treasures from the Land: New Zealand Craftsmen and Their Native Materials

Treasures of Hungary: Gold and Silver from the Ninth to the Nineteenth Century

Tours for Period October 1, 1985, through September 30, 1986

Number of bookings	357
Number of states served (including Washington, D.C.)	46
Estimated audience	5 million
Exhibitions listed in last <i>Update</i> (catalogue of SITES exhibitions)	113
Exhibitions produced for tour during this year	26

PUBLIC SERVICE

Ralph C. Rinzler, Assistant Secretary for Public Service

Office of the Committee for a Wider Audience

The Office of the Committee for a Wider Audience (OCWA) was established in June 1986 to formalize the work of the ad hoc Committee for a Wider Audience, which was established in 1983 to evaluate Smithsonian programs and exhibitions and to make recommendations for improving the Institution's capacity to serve a more varied and diversified American and international public.

In pursuit of these objectives, the office and its advisory committee members have visited most of the Institution's museums and offices. Following these visits, the office communicated to museum and office directors and staffs the committee's impressions of exhibitions and programs, as seen from the point of view of audiences whose outlook and cultural backgrounds have not conformed to those of traditional Smithsonian audiences.

The office's advisory committee is composed of seven Smithsonian staff members and seven people from outside the Institution representing Native Americans, Black Americans, Hispanic Americans, and Asian Americans.

The year began with the establishment of an Institution-wide network of OCWA liaison officers. In addition, the office initiated a major project, "Towards a Comprehensive Smithsonian Wider Audience Development Plan," which includes the following activities: 1) Museums and New Audiences: A Planning Conference. The office will convene selected scholars, museum educators, public relations and media specialists, and specialists in audience development to discuss and formulate techniques for developing new audiences. 2) Publication of a "How To" manual for attracting wider audiences. 3) Inauguration of the Smithsonian Cultural Education Committee. This multicultural, multiracial committee of citizens in the Washington metropolitan area will assist the Institution in developing community networks, program development, and fund-raising.

The office continues to execute these plans and to organize its work on the perspective that successful wider audience participation in the Institution's programs is ultimately related to excellent scholarship, interpretation, and conscientious diffusion of knowledge and information that reflects the contributions of all cultural communities to history and culture.

Office of Elementary and Secondary Education

A firm belief in the power of museum objects as educational resources is the guiding principle behind the activities of the Office of Elementary and Secondary Education (OESE). Through its programs and publications, the OESE works with other Smithsonian education offices to foster the educational uses of museums locally and throughout the nation.

OESE seminars and courses for teachers demonstrate how to teach by using a museum-oriented approach. In 1986, a series of ten summer seminars in history, art, and science provided professional training for more than 300 Washington, D.C., area educators. In addition, two graduate-level courses, "Using Museums to Teach Writing" and "Using Museums to Teach Social Studies," were offered to teachers from across the nation. And the office developed a pilot Teacher Intern Program to build on the work of its Regional Workshop Program. Coming from across the country, the teacher interns spent four weeks at the Smithsonian, earning graduate credits while working behind the scenes; upon returning home, they began to serve in a continuing way as resource people to strengthen relations between museums and schools in their communities.

Publications designed to help teachers use museums and other community resources with their students are a key aspect of OESE programming. In addition to its regular periodicals, *Let's Go to the Smithsonian* and *Art to Zoo*, the office produced *Smithsonian Spectrum*, a brochure advertising programs of the Smithsonian education departments in the Washington area. For junior high school readers, *Journeys*, a pilot magazine published in cooperation with the Office of Public Affairs, discussed the history of the 1950s. For senior high school science teachers, a teacher's guide explained how to use a Smithsonian World television show to assist classroom work.

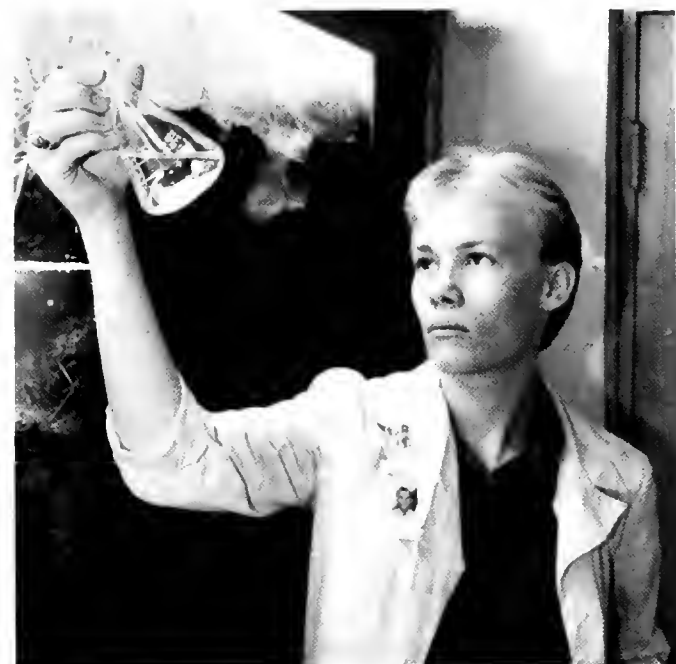
In addition to continuing its work in making programs and exhibitions accessible to disabled visitors here at the Smithsonian, the office is producing a docent training manual, to be accompanied by a videotape, to encourage accessibility in museums across the United States. For learning disabled students, a curriculum kit designed to teach concepts of historical time is being developed.

During the 1985-86 school year, OESE expanded its programs for young people. The Career Awareness Program—part of the Institution's affirmative action effort—offered summer placements for program graduates, giving them an opportunity to deepen their career awareness while serving as volunteers or as paid interns. The "Exploring the Smithsonian" program brought more

Office of Folklife Programs

than 5,400 District of Columbia public junior high school students to the museums for curriculum-related lessons. And the Summer Intern Program—which places outstanding high school graduates in curatorial or technical offices—brought forty young people to the Institution from across the United States.

Through teacher training programs, publications, special education programs, and precollege training for young people, OESE continues to help teachers and students effectively use museums as educational resources.



An Office of Elementary and Secondary Education high school summer intern tests the salinity of water from an exhibit at the Marine Systems Laboratory at the National Museum of Natural History. (Photograph by Laura Scott)

Most Americans would agree that the richness of the nation's culture lies in the impressive diversity of its people and in their creative responses to historical conditions. Research, presentation, and preservation of this cultural wealth is the goal of the Office of Folklife Programs—an effort that entails, among other activities, the presentation of living folk traditions in the context of the national museum. Since its inception, the office has directed its attention to the identification and study of folk traditions and to the development of methods for presenting them in a national setting to general audiences. The Office of Folklife Programs also cooperates with other Smithsonian bureaus in research and exhibit production; it publishes documentary and analytic studies, and its staff undertakes both exhibition-oriented and publication-oriented research.

Festival of American Folklife

The Office of Folklife Programs planned and produced the twentieth annual Festival of American Folklife which took place June 25–29 and July 2–6, 1986. Cosponsored by the National Park Service, this year's festival featured folklife from Japan, Tennessee folklife, American trial lawyers, cultural conservation, and evening dance parties. More than one million people attended the festival.

"Rice in Japanese Folk Culture" presented sixty-five Japanese and Japanese-American folk artists who demonstrated the importance of rice in their crafts, performances, and food preparations in a Japanese village environment. Featured were a rice paddy where a traditional planting ceremony took place daily, a children's area, and a shrine.

The diversity of Tennessee's cultural ecology was examined with ninety representatives who presented their occupational crafts and food traditions indigenous to mountain, plateau, and riverine areas. The state's rich musical heritage was highlighted with traditional music styles as expressed in old-time country music, gospel, Memphis blues, and rockabilly.

The artistry and lore of trial lawyers was presented by thirty-five participants from around the country. This popular and critically acclaimed program—developed in terms of the office's innovative model for the presentation of occupational folklife—featured advocates who argued hypothetical civil and criminal cases, demonstrating their narrational, dramatic, and logical skills.

"Cultural Conservation: Traditional Crafts in a Post-Industrial Age" presented forty craftspeople, from a vari-



Tabayashi, the ritual rice-planting ceremony, is performed by several Japanese participants in the rice paddy built for the Japan program of the twentieth annual Festival of American Folklife that took place June 25–29 and July 2–6 on the National Mall.

ety of indigenous and ethnic communities in the United States, who shared with audiences their efforts to maintain their craft-making legacy in contemporary American society. Featured traditions included Cherokee basketry, Hispanic weaving and wood carving, Hmong embroidery, Afro-American quilting, and Italian-American stone carving.

In celebration of the festival's twentieth anniversary, thirty-five artists who have had a significant impact on the festival and in their own communities presented all-day concerts. Traditional musicians drew the significant participation of local ethnic communities in dance parties held during festival evenings.

Research

Research, writing, and production continued on monographs and accompanying films included in the *Smithsonian Folklife Studies* series. Established in 1978, this innovative series combines book-length monographs with accompanying ethnographic films to document and analyze particular traditions more fully than would be possible with either medium used alone. A session devoted to the series was held at the annual meeting of the American Anthropological Association.

Development continued on collaborative research projects regarding music and agriculture in the Americas,

Arab Gulf States folklife, and Pakistani ethnography. Staff research on African epics, South Asian folk arts and folk agriculture, U.S. Gulf Coast culture, Native American wild rice use, the culture of Hispanic bread making, Black expressive culture, and folklore of the aging resulted in numerous publications and presentations to diverse audiences.

The Stone Carvers, a film by Majorie Hunt and Paul Wagner, was awarded an Emmy Award for best direction in the short documentary category by the Academy for Television Arts and Sciences. The film, highlighting carvers at the Washington Cathedral, grew out of 1978 and 1979 festival programs.

Office of Public Affairs

The Office of Public Affairs acquaints the public, via the communications media and other means, with the Smithsonian's research, exhibitions, and permanent collections. The office also oversees Institution-wide information programs.

As part of its ongoing commitment to reach an ever-wider audience, the office launched the Hispanic edition of the Smithsonian News Service. The Hispanic edition, a two-year project funded by the Educational Outreach Fund, is distributed free to eighty Spanish-language newspapers in nineteen states, Washington, D.C., Puerto Rico, Canada, and Colombia. Thirty-two additional Hispanic newspapers currently receive the News Service in English.

The News Service, inaugurated in October 1979, consists of four bylined feature articles each month. Stories cover topics in art, history, contemporary life, science, technology, and the environment. Among the forty-eight timely articles of fiscal year 1986 were features on earthquakes, the American tourist, the Harlem Renaissance, and the art of advertising. The News Service is distributed free to more than 1,550 daily and weekly newspapers. Among other new subscribers this year was *Navajo Times Today*, the daily newspaper of the Navajo Nation.

The News Service also joined the Electronic Age this year when it began offering the English-language edition to newspapers via Associated Press DataFeature, a computerized wire service distributing syndicated columns worldwide. For a modest charge, subscribing newspapers conveniently receive the monthly edition of articles by computer from Associated Press, thus eliminating re-keyboarding.

During the year, the office issued more than 500 news releases on Smithsonian activities and also provided publicity assistance to other Smithsonian bureaus and offices. The office planned and implemented major publicity campaigns for the National Museum of American History's *Information Revolution* exhibition, the Arthur M. Sackler Gallery's acquisition of the Vever Collection of Islamic and Persian paintings and manuscripts, the Office of Folklife Programs' Festival of American Folklife, and the Directorate of International Activities' National Forum on BioDiversity, cosponsored with the National Academy of Sciences.

The office organized a behind-the-scenes day for feature writers at the Smithsonian Environmental Research Center in Edgewater, Maryland, and prepared a publicity campaign for the tenth anniversary of the Dibner Library of rare books related to science and technology. Publicity materials prepared in the office stimulated me-

dia interest in the quadrangle complex and in the Chicago and Philadelphia Documentation Projects, conducted by the Archives of American Art to identify art-related materials in city cultural institutions.

To encourage visits to the Smithsonian from nearby regions, the office produced a thirty-second public service announcement for television. The announcement invited visitors to discover "what's new" at the Smithsonian during the less-crowded fall and winter seasons.

The office's publications program produced a redesigned calendar of Smithsonian events which appears monthly in the *Washington Post* and is distributed locally to nearly 1,100 civic organizations. *The Torch*, the Smithsonian's monthly staff newspaper, and the Smithsonian News Service received top honors in the Society for Technical Communications International Publications Competition and in the National Association of Government Communicators' Blue Pencil competition. The circulation of *Research Reports*—an award-winning periodical describing Institution-related research in the sciences, art, and history—rose by more than 10,000 to reach 45,500. The office redesigned and updated *Yesterday and Today*, a guide to the Smithsonian for journalists, and produced brochures for the Department of Botany and the Smithsonian Tropical Research Institute.

Office of Smithsonian Symposia and Seminars



This "class portrait" was taken of participants in the "Man and Beast Revisited" symposium held May 6-9, 1986.

The office undertook a series of related initiatives to more effectively pursue its specialized functions on behalf of the Institution. The guiding principle behind such programs was stated by Joseph Henry more than a century ago: "knowledge should not be viewed as existing in isolated parts, but as a whole, each portion of which throws light on all others. . . ." A new emphasis on the integration of knowledge, coming from the sciences and the humanities, reaffirms this wholeness of scholarly outlook. The office launched an endowment campaign and has plans for an intramural, interdisciplinary faculty enrichment seminar series for Smithsonian staff and fellows and will reflect its ongoing purposes in its new name, the Office of Interdisciplinary Studies, effective in December 1986.

The office's two major programs this year commemorated important events in history by exploring current developments in research. "Liberty: As Idea, Icon, and Engineering Feat," a colloquium held October 19 at the Cooper-Hewitt Museum in New York, examined the implications of the Statue of Liberty's centennial for intellectual and immigration history, technology, and cultural diplomacy. Wilton S. Dillon, director of the office, and Neil G. Kotler will edit an anthology on the colloquium for the Smithsonian Institution Press. "Man and Beast Revisited," held May 5-6, was organized as a sequel to

the Smithsonian's acclaimed 1969 symposium "Man and Beast: Comparative Social Behavior." Symposium Chairman and National Zoological Park Director Michael H. Robinson said, "Significant changes in our state of knowledge, the intellectual climate, and the state of the world in which man and beast coexist more than justify a new look at the subject." In working sessions at the Conservation and Research Center in Front Royal, Virginia, and a public forum at the National Zoo, alumni and other scholars examined aspects of sociobiology; genetics; evolution; the role of language, myths, and symbols in distinguishing humans from other animals; the mental health implications of human-pet bonding; and the urgent need for more research in these fundamental areas. Theories and data advanced at the symposium will appear in a book edited by Dr. Robinson and Lionel Tiger.

High Technology and Human Freedom, edited by Lewis H. Lapham, from the 1983 international symposium "The Road After 1984: High Technology and Human Freedom"—which was a tribute to George Orwell—was published by the Smithsonian Institution Press. Another group of essays is being assembled for publication by Robert S. Peck, director of the American Bar Association's Commission on Public Understanding About the Law. The working title for the collection is *Governing A*

Office of Telecommunications

Changing Society: Constitutionalism and the Challenges of New Technology.

The ninth international Smithsonian symposium "Constitutional Roots, Rights, and Responsibilities" is scheduled for May 18–23, 1987, in Charlottesville, Virginia, and Washington, D.C. The University of Virginia and the American Bar Association are the principal collaborators of this symposium commemorating the U.S. Constitution's bicentennial. Continuing meetings engaging scholars and arranging financial support have included liaison with universities in the United States, Scotland, and elsewhere in Europe. A distinctive feature of the symposium will be its international context, as the U.S. Constitution is the culmination of the ideas and influences of many peoples, and it in turn has helped shape the political life of diverse nations.

Work on the Festival of India symposium volume is nearing completion under the editorship of Carla M. Borden. The Smithsonian Institution Press is expected to publish the volume in fall 1987, and discussions are under way for an Indian edition. British architectural historian Caroline Stanley-Millson gave a lecture on November 6 on shrines and dwellings of south Indian tribal groups she has studied.

New projects include a symposium to deal with the implications of new technologies for leisure and creativity in the arts, as part of the opening of the Arthur M. Sackler Gallery of Asian art, and a symposium to accompany the presentation of the first General Foods World Food Prize in October 1987, in conjunction with the Winrock International Institute for Agricultural Development.

Continuing its primary mission, the Office of Telecommunications (OTC) extended the benefits of the Institution's research and knowledge to the American people through distinctive films, radio, and television programs.

"Here at the Smithsonian," the series of short features for television based on Smithsonian scholarship, launched its fifth season with a record-breaking number of subscribing television stations—up from 75 to 180. The series was offered on the PBS satellite for the first time, enabling the office to use more timely material and reach a larger market more economically. "Here at the Smithsonian" reaches 50 percent of the prime-time viewing audience across the United States, according to the National Academy of Television Arts and Sciences.

The office intensified its distribution efforts for Smithsonian films and video programs with gratifying results. Direct sales to television and the educational market provided modest trust fund revenues. With this arrangement future productions can rely more heavily on these funds rather than other sources. The new methods of distribution also mean increased audiences in school systems and in specialized settings such as scientific societies and professional organizations.

Based on intensive research and consultation with



Office of Telecommunications' cameraman John Hiller and producer Lee Cioffi videotape the activities at the 1986 Festival of American Folklife for the office's national series of television shorts "Here at the Smithsonian." Working with them is sound recordist Alan Perry.

Smithsonian educators, professionals at the National Education Association, and members of Harvard's graduate education faculty, a pilot program for a children's television series titled "Smithsonian Quest" was completed. The pilot drew upon the expertise of Smithsonian curators and scientists, providing information in a lively and entertaining manner. Aimed at nine-to-twelve-year-olds, the pilot is being evaluated by broadcast programmers and education experts to determine the next steps for an ongoing series that would share the Institution's scholarship with a young constituency.

The office's commitment to assist other bureaus with their audiovisual needs was given added scope when all of the unit's staff were relocated to a newly constructed complex in the National Museum of American History. With more efficient studios, editing rooms, and offices, OTC can better serve in-house clients. Services ranging from creating short exhibit films to preparing archival recordings are performed on a frequent basis.

"Radio Smithsonian," a weekly thirty-minute series, continues as the most long-standing OTC broadcast effort. Now in its seventeenth year, the series has become a staple for many member stations of National Public Radio—with a potential weekly listenership of four million people. Subscription fees now bring in more than half the production costs. "Smithsonian Galaxy," a series of short radio features, continues with 230 subscribing stations in the United States and around the world.

Eight film festivals recognized OTC productions with awards this year. Significantly, many of these honors came in the categories of environmental conservation, maritime sciences, and ecology—demonstrating the contribution these films make to the layman's understanding of issues that affect mankind on a global scale.

The office produced the Smithsonian's first live teleconference for the Directorate of International Activities. The final event of the four-day National Forum on Bio-Diversity cosponsored by the National Academy of Sciences and the Institution, this two-hour program was telecast via satellite to more than a hundred downlink sites on university campuses nationwide. Distinguished panelists spoke on the critical issues of rapid destruction of the Earth's natural habitats and the subsequent loss of plants and animals. The teleconference offered an unprecedented opportunity for students, educators, policymakers, and the general public to phone in questions on this timely issue. As well as producing the teleconference, the office coordinated the many sites and designed and distributed supporting promotional and publicity materials.

Fiscal year 1986 was productive, with several landmarks, for the Smithsonian Institution Press. This very publication, *Smithsonian Year*—edited, designed, and produced by the Press—was published in a format unique in the annual report's near 150-year existence. *Smithsonian Year 1985* proved so attractive that many people admitted to actually reading it, and requests for additional copies far exceeded previous years. The archival *Supplement* to the annual report was, for the first time, published from camera-ready copy and disseminated in microfiche form. These major departures from past practices in producing the *Smithsonian Year* reduced publishing costs.

In another development, Press managers decided that an evaluation of publishing procedures was needed since the University Press list has grown over the past twelve years from some four books a year to more than forty new titles each year. Press management formed internal working groups. Participation from all levels of staff resulted in a document, *SIP Systems Management for University Press Books*, that sets forth procedures required to publish a university press book. This analysis is enabling the University Press division to function more efficiently. An integral element in this systems approach is the Press's new *Guide for Authors* that explains step-by-step how to prepare material properly for submission to the Press.

The Series program continued advancing toward its goal of processing most of its manuscripts electronically, which will provide savings in federal publication budgets around the Institution. For example, two-thirds of all *Contributions* and *Studies* publications prepared this year used an electronic manuscript furnished by the author. Editing and design were done on Smithsonian Institution Press personal computers, and the resulting coded disks were sent to a commercial vendor for typesetting and page makeup. This represented a 100 percent increase over last year in the proportion of electronic manuscripts handled by the Series program and resulted in substantial savings for bureau sponsors of Series publications.

Some of the titles published under the Series program in fiscal year 1986 were "Giant Camels from the Cenozoic of North America" by Jessica A. Harrison (*Smithsonian Contributions to Paleobiology*, No. 57); "Rails of the World: A Compilation of New Information, 1975–1983 (Aves: Rallidae)" by S. Dillon Ripley and Bruce M. Beehler (*Smithsonian Contributions to Zoology*, No. 17); and "United States Women in Aviation 1930–1939" by Claudia M. Oakes (*Smithsonian Studies in Air and Space*, No. 6).

Near the end of the fiscal year, a laser printer and page-makeup software were added to the editorial computers, enabling all Series publications in fiscal year 1987 to be processed at the Press all the way to camera-ready copy.

A crucial element in the Press's Five-Year Plan has been the addition of full-time acquisitions editors. Their effect can be seen in the development of a strong anthropology list; a new series in ethnographic inquiry; a series on musicology; and the growth of the series in nature studies and in the solar system.

The Press, with the assistance of William Merrill and Ivan Karp—Department of Anthropology curators at the National Museum of Natural History—established the Smithsonian Series in Ethnographic Inquiry. The first book in the series, *Tsewa's Gift: Magic and Meaning in an Amazonian Society* by Michael F. Brown (Williams College), was published in January; and by the end of the fiscal year a fourth volume in the series, *Pintupi Country, Pintupi Self: Sentiment, Place, and Politics among Western Desert Aborigines* by Fred Myers (NYU), was published.

A companion series in archaeology has followed, under the editorship of Secretary Adams and NMNH Department of Anthropology curator Bruce Smith. The first three volumes in the Smithsonian Series in Archaeological Inquiry will be published in 1987. The first volume is *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, edited by Frank Hole (Yale).

The following are some of the general publications published in fiscal year 1986 by Smithsonian Institution Press: *The Mystery of Comets* by Fred L. Whipple; *Animal Extinctions: What Everyone Should Know* edited by R. J. Hoage; *Treasures from the National Museum of American Art* by William Kloss; *Rethinking Regionalism: John Steuart Curry and the Kansas Mural Controversy* by M. Sue Kendall, second in the Press's New Directions in American Art series; *Red Fox: The Catlike Canine* by J. David Henry, and *Harrier, Hawk of the Marshes* by Frances Hamerstrom, Smithsonian Nature Books; and *The Smithsonian Book of North American Indians* by Philip Kopper, this year's primary publication from the Smithsonian Books division.

The talent of a dedicated staff brought a shower of awards. *The Pleasures of Entomology* by Howard Evans has won three awards to date: Science Books and Film Editor's Choice; Young Adult Books, American Library Association's *Booklist*; and a *Library Journal* Outstanding Sci-Tech Book of 1985. David B. Lellinger's *Field*

Manual of the Ferns and Fern-Allies of the United States and Canada was named a *Choice* Outstanding Academic Book. Ann Uhry Abrams's *Valiant Hero* was selected Editor's Choice, Adult Books, by the American Library Association's *Booklist*. The National Association of Government Communicators recognized *Sculpture in the Federal Triangle* by George Gurney, which won first place in Books for General Audience; *Islamic Metalwork in the Freer Gallery of Art* by Esin Atil, W. T. Chase, and Paul Jett, which took second place in Books for Professional Audience; and the National Air and Space Museum's *Research Report 1985*, which received second place in Publications for a Technical Audience.

The Recordings division of the Press produced, and in January 1985 released, *Virtuosi*, a six-record or five-cassette set featuring great artists in performances recorded from 1926 to 1954. Notes on this classical offering were written by music critics Richard Freed (who also programmed the album) and Peter Eliot Stone. The digitally mastered six-record or five-cassette set *W. A. Mozart* was released in August. This recording by the Smithsonian Chamber Orchestra, the Smithsonian String Quartet, and guest artists represents the first time certain of these works have been recorded on authentic period instruments. The accompanying booklet was written by Kenneth Slowik of Public Programs. *American Popular Song*, produced by J. R. Taylor, was nominated for a Grammy for Best Historical Album. The program and album notes, prepared by J. R. Taylor, James Morris, and Dwight Blocker Bowers, were also nominated for a Grammy.

In addition, the Press in conjunction with the American Association of University Presses helped establish a nationwide program to increase the number of minority members in university press publishing. The program, funded by the Metropolitan Life Foundation, entails the hiring by an AAUP member press of a qualified candidate in a salaried position. The Smithsonian Institution Press and the MIT Press both hired candidates in August 1986.

The *Smithsonian* magazine is the official magazine of the Smithsonian Institution. And to many of its primary audience of 4,000,000 and pass-along audience of an additional 3,000,000, the magazine represents the only experience they have of the Institution.

The magazine has the largest circulation of any museum-affiliated magazine in the world. The Institution's educational message is evident in the magazine's regular coverage of every subject area of the Smithsonian museums: art, history, natural history, science, and technology.

While it deals directly with the Institution every month through columns such as the Secretary's "Horizon," Ted Park's "Around the Mall," and Constance Bond's "Smithsonian Highlights," the magazine is not a house organ in the usual sense—nor was it ever intended to be. Rather, its mandate is to represent the Smithsonian explicitly and also to deal with what the Institution might be interested in.

Subscribers receive discounts on books and records from Smithsonian Institution Press and on the educationally related gifts available in the Museum Shops and through the catalog. Subscribers are also eligible to participate in tours, regional events, and other activities of the Resident and National Associate programs.

The magazine provides a constant flow of new members to the Contributing Membership, the Resident Associate Program, and the Cooper-Hewitt Museum Associate Program. For these programs, the magazine is the principal benefit of membership.

The museums are places of enchantment and magic, but their spirit is extraordinarily difficult to translate. Yet the magazine, which combines sound writing and excellent photography, consistently captures that magic and has attracted and held an appreciative audience. In fiscal year 1986, membership reached a new high, and the renewal rate improved. More than 28,350,000 copies were mailed to subscribers nation-wide.

Smithsonian produced 1,185 editorial pages last year. Article topics ranged from François Boucher to Diego Rivera, from polar bears to the reconstruction of the pterosaur, from Nicolai Tesla to the 350th birthday of Harvard. *Smithsonian* again examined the scientific research in the Antarctic—this time in midwinter—making the magazine's coverage the most thorough to appear in any general publication. The article that prompted the most readership response was Oxford biologist David MacDonald's piece on the remarkable meerkats of the Kalahari desert—a response that could be measured by the more than 30,000 Associates who bought meerkat posters.

"Smithsonian World," the prime-time television series coproduced by the Smithsonian Institution and WETA, enjoyed a successful second season with host David McCullough during fiscal year 1986. Twelve one-hour specials have been produced since the series began in January 1984. An average of eight million people views each program.

During fiscal year 1986, three programs were aired: *Where None Has Gone Before* in October; *On the Shoulders of Giants* in January; and *American Pie* in March.

"Smithsonian World" added several major awards to its list of honors, including an Emmy for the Anne Morrow Lindbergh segment in *Crossing the Distance*, first televised in February 1984. In April 1986, the series received top honors in the Ohio State Awards 50th Year Program competition; *Filling in the Blanks* and *Heroes and the Test of Time* were cited. "Smithsonian World" also won a gold medal for Best Magazine Series at the International Television and Film Festival of New York in November 1985.

In January 1986, Adrian Malone became the executive producer of the series. His previous credits include *The Ascent of Man*, *Cosmos*, and *The Age of Uncertainty*.

Visitor Information and Associates' Reception Center

Centralized information and assistance are hallmarks of the diverse services provided by the Visitor Information and Associates' Reception Center (VIARC) to the public, Associates, Smithsonian staff, volunteers, and interns. Many services are offered seven days a week and are implemented by large numbers of volunteers coordinated by VIARC staff.

Significant progress was made in obtaining funding for the proposed Smithsonian Information Center, with the Pew Memorial Trust pledging \$1,000,000 and the Kresge Foundation offering a challenge grant of \$500,000. In preparation for construction associated with the center, VIARC moved from the South Tower Room, its headquarters for fifteen years, to temporary offices in the Commons lounge.

Another major VIARC project, the proposed Institution-wide exterior graphic information system, moved forward with installation of prototype signs for review by appropriate regulatory agencies and commissions.

The new Air and Space Associate Program affected several VIARC operations: a new Associates' reception desk was established at the National Air and Space Museum where some 2,000 memberships were sold; the Public Inquiry Mail unit responded to approximately 6,000 requests for further information from readers of the first issues of *Air & Space/Smithsonian* magazine; and reduced-rate Air and Space Associate memberships for staff and volunteers were added to the fulfillment responsibilities of the Staff, Volunteer, and Intern Services unit.

Record breakers included the Group Orientation Program's increase of 20 percent in attendance at early bird slide/lectures offered before museum hours during summer months, and the 35 percent increase in phone traffic experienced by the Telephone Information Services, which logged more than 400,000 calls. On the Dial-a-Phenomenon line, interest in Halley's comet in November and December 1985 generated nearly 19,000 calls. The Public Inquiry Mail Service responded to more than 50,000 pieces of mail, an increase of more than 33 percent.

Activities initiated during the year were varied: the Museum Information Desk Program began seven-day-a-week operations at the National Museum of American Art in February 1986, bringing the number of museum desks staffed to fourteen; the Group Orientation Program, after promoting its service to convention groups, sent information specialists to make slide/lecture presentations to such organizations as the American Society of

Newspaper Editors, the American Psychotherapy Association, and the Elderhostel at American University; the Castle docents' knowledge of the historic Smithsonian Institution Building was shared for the first time with participants of tours sponsored by the Resident Associate Program. New activities of the Information Outreach Program included promotion of National Associate membership through Metrorail's new Family Tourist Pass plan and coordination of the selection of a Smithsonian volunteer entry for the Washington Convention and Visitors Association (WCVA) annual competition to recognize exceptional service to the visiting public. Louise Steele, a fifteen-year VIARC volunteer, received the first WCVA Hospitality Award for "Outstanding Volunteer."

Extension of services were affected by other units. The Public Inquiry Mail unit agreed to respond to general queries for the National Zoological Park and to handle public-request distribution of the Institution's annual report for the Smithsonian Institution Press. Staff, Volunteer, and Intern Services unit added the Arthur M. Sackler Gallery, the Woodrow Wilson Center's Kennan Institute, the Directorate of International Activities, and *Smithsonian* magazine in New York to its volunteer and internship rolls. The annual Institution-wide survey of volunteer participation conducted by this unit showed that during fiscal year 1986 5,546 individuals contributed 450,659 hours of service to the Institution.

ADMINISTRATION

John F. Jameson, Assistant Secretary for Administration

Administrative and Support Activities

The Institution operates effectively as a highly decentralized organization with programs extending across the country and with projects in many foreign countries. A variety of central support offices work to assure the success of scholarly and public activity and at the same time provide central oversight and accountability for the management and use of financial, personnel, and physical resources. These organization units include programming and budget, personnel administration, equal opportunity, printing and photographic services, contracts, special events, travel services, supply services, audits and investigations, congressional liaison, facilities (including design and construction management, plant services, protection, safety, and architectural history), information resource management, and management analysis. Funding for central services amounts to about 7 percent of the Institution's total operating expenses exclusive of the costs of maintenance, operation, and protection of facilities. The major over-all emphasis by the administrative and support units was twofold: provide effective and timely services to users; and assure that the Institution maintained a high level of control and accountability as a public organization.

In a coordinated effort involving the Office of the Assistant Secretary, the Office of Programming and Budget (OPB), and the Treasurer's Office with the involvement of bureaus and offices throughout the Institution, the *Five-Year Prospectus, FY 1987-FY 1991*, covering the Smithsonian's program and facility development plans, was prepared for approval by the Board of Regents at the January 27, 1986, meeting. Work started soon thereafter on the draft prospectus for fiscal years 1988-92 for the Regents' review at their September 16, 1986, meeting. During 1986, the Office of Programming and Budget continued to encourage program managers and administrators throughout the Institution to participate in the formulation of the fiscal year 1987 unrestricted trust fund and the fiscal year 1988 federal budgets. In cooperation with the Under Secretary, the planning officer, the Management Analysis Office, and the Office of Audits and Investigations, OPB provided critical support to program managers and administrators in the development of guidelines to absorb the across-the-board reductions enacted as the result of the Balanced Budget and Emergency Deficit Control Act of 1985 (Public Law 99-177) and with plans for how to deal with possible major budget reductions in the future. The office also continued to increase its use of automated systems for budget analysis, monitoring, and presentation. In July 1986, a new

director of the Office of Programming and Budget joined the Institution.

In its fourth year, the Office of Information Resource Management (OIRM) continued its transition from a central data-processing service center to a leader of distributed information management. The distributed pattern is one in which bureaus and offices own and employ mini- and microcomputers linked to each other and to the OIRM mainframe by data communications systems. OIRM began to develop the new Collections Information System (CIS) for specimens by building a prototype system for the Division of Fishes collections. As collections information is moved to the new system, it is standardized to ensure long-term value. A CIS Steering Committee of collections managers and registrars was organized to guide OIRM's efforts. The Smithsonian Institution Bibliographic Information System (SIBIS) focused on research files, such as the new Inventory of American Sculpture, which will become a national data base. A letter of agreement was signed with the Department of Agriculture for them to run the Smithsonian's personnel/payroll system, beginning in fiscal year 1987; the new system will provide the Smithsonian with on-line update and enquiry to these vital records. Construction began on the Mall Master Raceway, which will house cables for data communications. The Information Resource Center expanded its curriculum of computer and software courses. Two important planning activities were launched: an Institution-wide, long-range information resource management planning exercise resulted in a set of long- and short-range automation goals, along with a recommendation for an annual planning cycle; and OIRM and Office of Plant Services' Division of Communication and Transportation collaborated on the first Smithsonian Electronic Communications Plan, which set broad direction for voice and data communications for the next several years.

The Office of Personnel Administration planned for its first major Reduction In Force (RIF) in connection with the closing of the Smithsonian Environmental Research Center's Rockville facility. Related to this activity was the revision and implementation of new RIF regulations. Union contracts with American Federation of Government Employees and National Maritime Union were renewed. Employees with the Parking Office were transferred to the federal rolls or were placed elsewhere on the trust fund rolls as a result of cessation of public parking. Personnel authority up through grade 15 was delegated to the Smithsonian Astrophysical Observatory.

The Office of Equal Opportunity (OEO) continued to emphasize special recruitment efforts for minorities, women, and disabled persons in all categories of employment. Goals for minorities and women were established Institution-wide at each organizational level for professional, administrative, and technical positions. The representation of minorities and women in professional and administrative positions and in grades above grade 12 improved to 18 percent of the total work force. Goals for disabled persons were established, and representation of disabled persons within the Institution continues to increase. The outreach program continued to inform minorities, women, and disabled persons and their advocate organizations of Smithsonian programs, exhibitions, activities, and career opportunities. Outreach efforts included equal opportunity exhibition displays and handouts at ten national conferences held by various organizations. In addition, equal employment messages were placed in five minority and women's publications that reached an audience of approximately three million people, one million more than last year. Special outreach efforts continue in the development of relationships with the Hispanic-American and Asian-American communities, including participation in ethnic group conferences, programs and cultural observances, and the establishment of a networking system for continuous liaison. Programs to highlight ethnic observances and to expand cultural understanding received increased attention and support throughout the Institution. OEO published a revised office memorandum on program accessibility which includes guidelines for making exhibitions, programs, and activities more accessible to disabled persons.

The Office of Printing and Photographic Services (OPPS) serves as the Institution's focal point for the taking, processing, and archival preservation of photographs for both museum collections and events of historic interest to the staff. The office is also the central provider of in-house printing. A Halon fire protection system was added to the OPPS cold storage room this year, and a flood barrier was installed at the entrance to protect the collection in the event of flooding. The nitrate film conversion program, begun in fiscal year 1981, is near the end of the first phase—the conversion of hazardous nitrate negatives to safety film. All converted negatives will be toned to further insure archival life. Equipment for a research program into applied photographic preservation was installed. Two initial projects include the testing of new toning solutions to eliminate the use of a suspected carcinogen and the testing of new color duplicating films against older color originals to deter-

mine the best matches of duplicating stock versus originals. The office completed filming all of its 35mm slides for the modification of its original video disc and added a second side, which will make a total of more than 70,000 images available. OPPS staff covered the events in New York related to the centennial of the Statue of Liberty as part of the office's historic documentation program. In addition to its third annual exhibition, *The Year in Pictures As Seen from the National Museum of American History*, OPPS is organizing an exhibition for Smithsonian Institution Traveling Exhibition Service entitled *The Vietnam Veterans Memorial: A National Experience*. There also will be a book on the memorial.

The Office of Supply Services, in collaboration with the Office of Accounting and Financial Services, implemented a new small purchasing system. The new program formally delegates to individuals in various units the authority to satisfy a greater number and variety of their everyday needs for lower cost products and services. Concurrently, the development of new procedures and forms will streamline the entire payment process. The Office of Congressional Liaison managed through the congressional process a number of important legislative matters. It also is responsible for assessing the impact of congressional initiatives on Smithsonian programs. The Management Analysis Office monitored the progress of actions needed to strengthen internal controls and continued its program of bringing carefully selected students in graduate schools of business administration to work on important management projects during summers at the Institution. This past year, five postgraduate students worked in the Financial Management and Planning, Museum Shop, Fellowship and Grants, and Mail Order Catalogue offices, and at the National Portrait Gallery. The Management Analysis Office also initiated a biweekly employee bulletin covering important and timely administrative matters. As the principal coordinating and organizing unit for Smithsonian events emphasizing Institutional programs and activities, the Office of Special Events managed several hundred events this year. The Office of Special Events received nearly 1,000 requests from outside organizations seeking to use Smithsonian space and determined which organizations met the policy requiring that events be closely related to the Institution's museum and education programs.

The Travel Services Office continued to assist and advise Smithsonian employees and consultants about the most efficient and economical travel possible. Travel arrangements for the Festival of American Folklife, featur-

ing participants from Japan and Tennessee, were successfully completed. Assistance was provided for research projects throughout the world including those near Puerto Maldonado, Peru, and at Grand Turk island in the Bahamas, as well as for the Smithsonian Foreign Currency Program grantees traveling to Pakistan and India. The Contracts Office handled negotiations for specialized contracts related to trust-funded operations and helped obtain federal grants and contracts for special programs and projects. The Office of Audits and Investigations, which reports to the Under Secretary, is responsible for performing all internal and external auditing and the investigation of any fraud, waste, abuse, or white-collar criminal activity by employees or contractors. The internal audit function includes both federal and trust-funded activities on a recurring basis. The external audit function involves the audit of documentation in support of claims, cost proposals, and cost and pricing data arising from contracts, grants, and other financial agreements.

Highlights for the Office of Facilities Services included 98 percent completion of the quadrangle complex. Major activities during the year directed by the Office of Design and Construction included the completion of the multiyear facade restoration at the Renwick Gallery; construction of an annex building for the Anacostia Neighborhood Museum; completion of a master plan for the Smithsonian Tropical Research Institute, as well as completion of the design for its Tupper facility; and completion of a master plan to replace heating, ventilation, and air conditioning systems for the National Museum of American History.

Significant progress in the Office of Plant Services this year included implementation of automated financial, personnel, and program management systems to increase staff efficiency and accuracy of information. A physical plant building inspection program was implemented to address essential short- and long-term maintenance and repair needs in Smithsonian facilities. Energy conservation efforts continued with emphasis on renewing program visibility throughout the Institution. Progress continued to improve and refine the work hour quota system in order to reduce backlogs in trade and crafts projects. Work on real property records continued for all Smithsonian-owned and -leased buildings and structures; only ten buildings at the Whipple Observatory in Arizona remain to be researched and documented.

The Office of Protection Services adjusted security operations in all museums to account for international ten-

sions. Individual efforts of the staff resulted in the first promotion of women in the guard force to the rank of lieutenant and the first certification as occupational health nurses of several of the Health Services staff. The Employee Assistance Program continued to expand its counseling services, and the first presentation of seminars on the program for executives and first-line supervisors is expected to result in more effective use of the counseling service by managers. The efforts to upgrade security systems and to provide a proprietary alarm system are almost complete.

The Protection Services staff continued to play a leading role in national and international efforts to improve the practice of museum protection. Through its classroom training programs, an annual security conference, and the annual museum protection workshop, the office provided training support to approximately half of the country's museums. Protection staff remains active in the programs of the American Association of Museums, the American Society for Industrial Security, and the International Council of Museums and its International Committee on Museum Security, having participated this year in two programs conducted for museums in Mexico by the U.S. Information Agency. Other outreach activities included participation in a program to improve protection afforded to U.S. embassies and in programs related to the health and safety of scientific divers.

The Institution's safety program was emphasized by establishing the Safety Division of the Office of Protection Services as a separate unit reporting to the director of Facilities Services, the Smithsonian's designated health and safety official. This change reflects the growth of the safety program and the importance of its work within the Institution as well as to the public's perception of the Smithsonian. The most notable activities undertaken by the Office of Safety Programs were the development of a hazardous materials management and disposal program and the establishment of a regulatory review and analysis process for ensuring compliance with safety and health laws. The office continued its work on asbestos abatement and control; installation of fire protection, detection, and suppression systems; and improvements to the physical plant.

An Office of Architectural History and Historic Preservation was created in June 1986 to strengthen the Smithsonian's interests and obligations in these areas. Chief among its accomplishments was the development of a comprehensive collections management policy for the Smithsonian Furnishings Collection.

Smithsonian Institution Women's Council

The Smithsonian Institution Women's Council was established by Secretarial memorandum in 1972 to identify and study the concerns of employees, to serve as an active advisory group to management on women's issues, and to strive for the improvement of working conditions with particular concern for encouraging the hiring, promotion, and equal treatment of women at the Smithsonian. The council's twenty members are elected by Smithsonian staff. Open meetings are held the second Wednesday of each month in the Regents Room of the Castle. Carolyn Jones is council chairperson.

The work of the council is done mainly by four standing committees: Benefits and Child Care, Newsletter, Outreach, and Programs. Ad hoc committees are created when necessary to further council goals. Recent projects included a national conference in March on "Women's Changing Roles in Museums," developed with the Office of Museum Programs; continued efforts toward the establishment of day-care centers in two museums on the Mall; publication of a brochure for new employees on the council's activities; sponsorship of a seminar and workshop on street harassment; and the founding of a Washington, D.C., area network for women in museums.

Smithsonian Internship Council

The Smithsonian Internship Council was established in 1981 as a result of provisions set forth in Office Memorandum (OM) 820 for intern programs at the Smithsonian. The council, made up of at least one representative from each bureau or office, provides a forum for staff working with interns. The council works to set common standards for interns and to improve coordination of internships throughout the Institution.

The Internship Council began fiscal year 1986 by continuing work on several projects inspired by the revision of OM 820, "Smithsonian Institution Internships," issued in March 1984. The memorandum established criteria for the selection of interns, guidelines for management to follow in the placement of interns, and clarification of several Smithsonian internship programs.

The following publications have been produced by the Internship Council and are updated periodically. *Internships and Fellowships* describes the majority of internship and fellowship opportunities at the Smithsonian. *The Handbook for Smithsonian Interns* provides pertinent information about procedures to be followed by interns while at the Institution. It also includes information about Smithsonian facilities, services, and activities available to interns. *Housing Information for Interns and Fellows* lists short-term housing available in the Washington metropolitan area.

The Internship Council's staff assistant registers all interns, provides identification credentials and orientation for interns, and produces reports about interns and internship programs throughout the Institution. The staff assistant also provides services for internships at the Woodrow Wilson International Center for Scholars. In fiscal year 1986, approximately 500 interns were registered at the Smithsonian by the staff assistant.

The Internship Council's Committee for Staff Orientation has initiated seminars to provide staff and supervisors with information about management of internships. During fiscal year 1986, the Internship Council received approval and funding to provide health insurance to interns who were not otherwise insured.

The Internship Council is continuing efforts to establish a central stipend fund. The council believes that many talented potential interns are lost to the Institution each year because they cannot afford to intern at the Smithsonian without minimal financial support.

DIRECTORATE OF INTERNATIONAL ACTIVITIES

John E. Reinhardt, Director

Directorate of International Activities

The Directorate of International Activities was established in October 1984 to monitor, coordinate, and enhance the Smithsonian-wide array of work in the international field; to be responsible for liaison with federal agencies and national and international organizations whose international activities relate to those of the Institution; to ensure balanced international program emphases, reflecting all world regions and all fields of existing Smithsonian interests from basic research in the natural sciences to popular culture and the performing arts; to help develop the effectiveness of all the Institution's international activities; and to plan, design, and conduct the programs of the International Center located in the quadrangle complex. The work of the Directorate is conducted through several divisions: a program staff primarily responsible for planning the programs of the International Center and filling the coordinating roles of the Directorate; the Office of Service and Protocol; and the Office of Publications Exchange. The Directorate also has responsibility for planning the 1992 Quincentenary of Columbus's landing in the Americas, and for management of the Smithsonian Foreign Currency Program.

International Center Programs

Through the International Center, the Institution pursues certain objectives not readily achieved through existing programs. For example, the Center will offer thematically integrated programs of exhibition, scholarly exchange, and public education, bringing to bear Smithsonian research and expertise on the explication of diverse cultures and regions of the world. Further, the center will fill a significant Institution gap in programs focused on Latin America and hemispheric interrelationships, for while substantial Smithsonian research actually goes on in middle and South America, it is scattered within the Institution and for the most part has low visibility. The center also will develop programs to encourage regular exchanges with scholars and museum professionals in other nations through the development of institutional relationships. In keeping with the special purposes of the quadrangle itself, all activities initially will concentrate on increasing contacts with and offering programs about Latin America, Africa, and Asia.

Even before the opening of the International Center, the Directorate has undertaken programs on broad themes of international importance. One theme is the urgent need to conserve the diversity of life forms in the

world now under siege. Special emphasis will be given to the tropics where diversity is greatest, while issues for the New World tropics coincide closely with the Center's Latin American focus.

The Smithsonian with the National Academy of Sciences organized in September a highly successful National Forum on BioDiversity. The four-day event provided the public with the views of distinguished scientists and scholars about the rapid destruction of Earth's natural habitats and the subsequent loss of plants and animals. Concurrent events included a poster-panel exhibition, film showings, and a national teleconference via satellite and cable.

The Directorate also began a three-year pilot program in cooperation with the National Museum of Natural History and the international Man and the Biosphere Program. Initially the goal is to design standardized methodology for collecting and managing biotic inventory and other biological data in all Biosphere Reserves, potential reserves, and other endangered habitats. (A Biosphere Reserve is an area selected for protection and study because it is a representative example of one of the world's major ecosystems.)

During fiscal year 1986 planning commenced for the International Center's inaugural exhibition and associated programs. The exhibition *Generations* is an ambitious and unprecedented multidisciplinary, multicultural investigation of the art and rituals associated with birth from ancient times to the present. Of particular importance will be the interpretation of non-Western materials in context, through concentration on the ways certain cultures view this subject, how they incorporate it into their world view, how they deal with its reality and symbolism, and how they express these ideas and concepts in material form.

Also in fiscal year 1986 the Directorate initiated programs aimed at increasing and strengthening regular exchanges between scholars in developing countries and Smithsonian researchers. This International Exchange Program supports workshops, training courses, and similar short-term group projects. In fiscal year 1986 ten projects conducted by five bureaus were chosen: for example, a collaboration between the Smithsonian Astrophysical Observatory and the Centro de Investigaciones de Astronomia in Venezuela, and museum training in the National Museum of Natural History for curators of vertebrate zoology in key Latin American museums.

A generous gift from the estate of Suzanne Liebers Erickson established a memorial fund to support exchange visits between Smithsonian staff and Danish

scholars, museum professionals, and students. Exchanges under the program will begin in fiscal year 1987.

Since 1965 the Institution has conducted the Smithsonian Foreign Currency Program (SFCP) to enhance the quality of its research and extend the impact of its scholarly efforts. In fiscal year 1986, management of the SFCP was transferred to the Directorate of International Activities from the Office of Fellowships and Grants. The Foreign Currency Program awards grants to support the research of American institutions, including the Smithsonian, in those countries in which the United States holds blocked currencies derived largely from past sales of surplus agricultural commodities under Public Law 480. In 1986 blocked currencies were held by the United States in Burma, Guinea, Pakistan, and Poland, and Indian rupees were available from the United States-India Fund for Cultural, Educational, and Scientific Cooperation, newly established to continue programs in India such as those earlier supported under the SFCP.

Covering many disciplines, this year's projects included studies of Indian music; archaeological exploration of the Roman period in Serbia and of Harappa in Pakistan; systematic studies of Indian bamboos and of the avian genus *Phylloscopus*; and assessment of desertifications as it affects grazing systems.

Also in this year the Smithsonian conveyed \$1,020,000 equivalent in Pakistan rupees, the final installment of the United States contribution, to the government of Pakistan for its campaign to salvage and preserve Moenjodaro, the 4,500-year-old Indus civilization city in Pakistan. The site is being eroded by highly saline groundwater and floods of the Indus River. A groundwater-control scheme to lower the water table is in place and other operations are under way.

In addition to programs of scholarly support, the Directorate sponsors conferences and meetings. During 1986 the Directorate conducted planning meetings on a wide range of subjects:

1) The history of science and technology in Latin America. Participants from six Latin American countries, Canada, and the United States focused on ways for the Smithsonian to further development of the history of science and technology in Latin America. A pilot program is being planned for 1988 to bring a small number of Latin American specialists to the Smithsonian for research on aspects of the history of United States-Latin American relations in science and technology.

2) Scientific research in Madagascar. Scientists around the world, including many at the Smithsonian, are fascinated with the unique life forms and geography of

Madagascar, and many consider it the world's highest conservation priority. Responding to encouragement by representatives of the government of Madagascar of Smithsonian research activities, a workshop on priorities and methods for doing research in Madagascar was conducted for participants from outside and within the Institution.

3) African material culture studies. The community of Africa scholars see the need for an international conference on African material culture research to bring together the technological, cultural, social, and economic aspects of the production, use, and value of objects in African societies. The Directorate, with the Joint Committee on Africa of the Social Science Research Council and the American Council of Learned Societies, conducted an extensive survey of scholars and museum professionals worldwide on issues to be discussed. Topics included technology and the production of form, ethno-historical studies of material culture, and symbolic studies of material culture. This meeting resulted in a plan for an international conference to integrate the perspective of a variety of disciplines and focus on how the study of African material objects can elucidate social relations, cultural change, and symbolic behavior. Foundation funding has been obtained for this conference.

4) Issues facing scholars seeking research access in foreign nations. In November 1985 the Directorate cosponsored with the Social Science Research Council (SSRC) a major conference to explore issues concerning access to research sites by foreign scholars, with specific reference to U.S. scholars' experiences working abroad. Participants included experienced field scholars in disciplines ranging from the biological and geological sciences to archaeology, history, and political sciences. The conferees concluded that access to research must be closely tied to collaboration and mutuality of benefit to the visiting researchers and their host-country counterparts. These and other matters developed in the conference are discussed in the SSRC's quarterly *Items* (March 1986) and the Smithsonian's quarterly *Research Reports* (Spring 1986).

Office of Service and Protocol

Within the Directorate of International Activities, the Office of Service and Protocol (OSP) prepares and implements agreements related to international cooperative programs; assists foreign dignitaries and scholars who participate in Smithsonian programs; facilitates communications and logistical arrangements for research and

participation in meetings abroad; and obtains passports and visas for Smithsonian travelers.

New links were established with the National Research Council of Iraq, with the negotiation of a cooperation agreement that will provide for a broad range of activities, including field research and museum training. A cooperation agreement was also concluded May 5, 1986, with the Jordanian Department of Antiquities providing for research, conservation, and preservation by the Smithsonian's Conservation Analytical Laboratory of Neolithic statuary found in Jordan. OSP continued to coordinate the activities arising out of the cooperative agreement signed two years ago with the Moroccan Ministry of Culture, and continued its oversight of exchanges with the People's Republic of China, including the first exchange under the Smithsonian's January 1985 Memorandum of Understanding with the China Association for Science and Technology (CAST). OSP, working jointly with the National Science Foundation, played a key role in arrangements for United States participation in the April 1986 Association of South East Asian Nations Science and Technology Week held in Kuala Lumpur, Malaysia.

In fiscal year 1986, OSP arranged Smithsonian visits for approximately 100 foreign officials and scholars. In October 1985, Indonesian Director General of Culture Haryati Soebadeo and Director of Museum Affairs Bambang Soemadeo met Secretary Adams and staff members to discuss Smithsonian cooperation in research and training. In February 1986, Bahraini Minister of Education and Culture Tariq Abdul Rahman Al Moayyed visited the Smithsonian for talks with Secretary Adams and other members of the staff on Smithsonian-Bahrain museum cooperation. In June, Uruguayan First Lady Marta Canessa de Sanguinetti met with Smithsonian officials and Washington, D.C., architect Avery Faulkner for discussions on the extended use of historic buildings for museum purposes. In August, a high-level delegation from the U.S.S.R. ministries of Culture and Foreign Affairs met with the Under Secretary and other Smithsonian representatives for discussions on several major exhibitions, including an exchange of art exhibitions and one on the peoples of the Arctic. In September, Cook Islands Prime Minister Sir Thomas Davis came to the Smithsonian to meet with Secretary Adams and Smithsonian staff.

The core of OSP's activity continued to be services to Smithsonian bureaus and during 1986 OSP obtained 101 passports and 784 foreign visas for Smithsonian staff and grantees; provided documentation and guidance services for eighty-six foreign students and exchange visitors; ar-

ranged for the United States entry of two large performing arts groups; and provided the Smithsonian staff with a variety of other immigration-related services. Throughout the year, OSP provided a broad range of liaison and support services for Smithsonian staff undertaking research and exchanges abroad including the establishment of a foreign currency research fund to support ethnological studies in Nigeria. OSP also provided assistance for research access for the National Zoological Park in Malaysia and for an exchange of Buddha figures with Korea. Work continues on the second edition of the Directorate publication *Profile of the International Activities of the Smithsonian Institution*, and a new publication, *Guide to International Research and Exchanges*.

Office of Publications Exchange

The Office of Publications Exchange (OPE) also reports to the Directorate. Its function is to foster international scholarly interchange by enabling U.S. universities and learned societies to exchange their publications with corresponding institutions and governments of other countries. Founded by the Smithsonian's first Secretary, Joseph Henry, OPE functions today as one of the oldest entities with ongoing activities at the Smithsonian. During 1986 OPE handled 86,740 packages from approximately 140 domestic institutions for transmission abroad and 37,680 packages from approximately 220 foreign institutions for distribution in this country.

Columbus Quincentenary Planning

The Smithsonian Institution's Quincentenary observance will be a mix of historical and cultural issues and ideas. Plans are to commemorate the encounter of civilizations, draw attention to subsequent exchanges of ideas and material cultures, and illuminate the creation of many new worlds. Through the organization of exhibitions and public and scholarly programs that explicate and celebrate five centuries of common experience in this hemisphere, the Smithsonian will help to shape the North American involvement in what assuredly will be an interhemispheric as well as transatlantic enterprise.

In fiscal year 1986, under the coordination of the Directorate, the Smithsonian began defining the objectives of its observance, and planning specific activities. The Directorate's efforts reflect a two-pronged approach to the Quincentenary: to have each Smithsonian museum



As part of the National Forum on BioDiversity, Noel Vietmeyer, of the National Research Council, discussed underexploited tropical animals as a future protein source. The forum, which took place in September 1986, was cosponsored by the Smithsonian Institution and the National Academy of Sciences.

and research bureau develop and implement its own programs within broad outlines established by the Institution and coordinated by the DIA; and to develop Directorate programs which will take place in the Smithsonian's International Center beginning in fiscal year 1987 and continuing through fiscal year 1993. Because the Directorate is charged with advancing better understanding of peoples and cultures, Quincentenary programs will explore the multilayered values, beliefs, and dynamics that define the cultures of the past and present peoples of Latin America.

Two planning conferences in the fall of 1985 gave Smithsonian staff an opportunity to exchange ideas with United States and foreign scholars in the arts, humani-

ties, and natural and social sciences about the critical themes and issues which the Institution might address in its Quincentenary programs. Following these meetings, there was established a Quincentenary Planning Committee to provide further oversight and review of Smithsonian programs. It includes historian David Warren (Institute of American Indian Arts), ethnomusicologist Carol Robertson (University of Maryland), and ethnohistorian Miguel Leon Portilla (Universidad Nacional Autonoma de Mexico), as well as Smithsonian staff members.

Within guidelines established by the Planning Committee, each Smithsonian bureau will develop and implement its own programs. The Museum of American History plans an extensive exhibition on early hispanic settlement in North America; the National Air and Space Museum has undertaken the creation of a world atlas composed of satellite photographs; the National Portrait Gallery is assembling an exhibition on portraiture of Spain. The Hirshhorn Museum and Sculpture Garden, the Smithsonian Institution Traveling Exhibition Service, and the National Museum of Natural History also are developing Quincentenary exhibitions. Other projects include plans by the Office of Folklife Programs to focus on Caribbean and Latin American cultures in their 1989-92 Festivals of American Folklife.

The International Center will explore in both scholarly and popular arenas specific aspects of the cultures of past and present peoples of Latin America. Beginning in 1987 and continuing through 1993, the International Center will organize scholarly seminars and conferences, public symposia, lectures, exhibitions, and performances to explore this theme. The Center's scholarly programming will commence in spring 1987 with a series of Quincentenary conferences designed both to develop a more comprehensive understanding of the cultures of Latin America and to form the basis for public programs. The selection of "World Views in Contact: Performance" as the topic of the first conference is based on the universality of performance and its centrality in ritual life.

The Smithsonian Institution is developing a joint venture with a British public broadcasting company and a noted independent producer to film a ten-part television series entitled *The Buried Mirror: Images of Latin America*. The production, to appear in 1989-90, will promote a broad understanding of the history of the confluence of indigenous and Hispanic traditions of the Americas. At the same time, it will introduce a multinational audience to the broad themes and topics of the international Columbus Quincentennial.

MEMBERSHIP AND DEVELOPMENT

James McK. Symington, Director

Office of Membership and Development

The Institution's organization for fund-raising was studied last year by a management consulting firm, and its recommendations resulted in a modified decentralization in structure and function.

The new development format permits museum directors, if they wish, to create their own development staffs, collectively expanding and extending the Institution's reach into the philanthropic marketplace. To assure a sense of Institutional priorities and to coordinate the new museum fund-raising efforts, Secretary Adams created the Development Committee. In addition to himself, members are the Under Secretary; the assistant secretaries for Research, for Museums, and for Public Service; the chairmen of the Council of Bureau Directors and of the Information and Education Council; and the director of Development, who is responsible for organizing and preparing committee meetings.

The Development Office has worked closely with the museum directors who have opted for their own development staffing. The director is responsible for interviewing all candidates for museum development officer and for providing counsel to the museum staffs. Moreover, the office continues to support museum development personnel with the research assistance which is so important in their work; to this end, the Development Office Research Unit is being enlarged. Finally, the office maintains complete files on all Institution fund-raising activities and is responsible for keeping up-to-date records of all donors and for the prompt acknowledgment of all gifts to the Institution.

Apart from museum project fund-raising described above, the Development Office is solely responsible for generating private financial support for pan-Institution projects, as well as for raising funds for those museums or offices which are not participating in the new arrangement.

The campaign for expansion of the facilities of the Cooper-Hewitt Museum continued. Much effort was expended upon the organization and assignments of the volunteer Campaign Committee and of a group of professional committees drawn from the design field; Gordon Dixon of the Brakeley, John Price Jones Company was selected as campaign director.

Based upon a very favorable feasibility study conducted by the Brakeley firm, a capital campaign was approved for the National Museum of African Art. During 1986, staff from the Office of Membership and Development were detailed to the campaign, and, working closely with Sylvia Williams, they organized the campaign office, set up the campaign schedule, wrote a bro-

chure, and began recruiting the volunteer committee. The campaign is focused on increased acquisition funds for the museum.

A grant of \$1 million was received from the Pew Memorial Trust toward the creation of a new Smithsonian Information Center in the Castle. The Kresge Foundation subsequently made a challenge grant for \$500,000, to be matched by gifts from Contributing Members and other sources, in order that visitors can better plan their time at the Institution.

The computer industry pledged about half of the \$4.2 million support necessary for a permanent exhibition, *The Information Revolution*. Similarly, Digital Equipment Corporation made a generous grant of \$770,000 of in-kind and cash support toward the *Computers and Flight* exhibition planned at the National Air and Space Museum.

Six Japanese corporations cosponsored the Japan program of the 1986 Festival of American Folklife. Also in the cultural arena, Pepsico agreed to sponsor one-half of a U.S.-U.S.S.R. exhibition exchange being coordinated by the Smithsonian Institution Traveling Exhibition Service, and the Washington Post Company is sponsoring a Gene Davis retrospective at the National Museum of American Art. The W. K. Kellogg Foundation has renewed a major grant for the Fellowship and Intern Program being carried out by the Office of Museum Programs for museum professionals across the country.

The Jesse Smith Noyes Foundation underwrote a new fellowship program at the Smithsonian Tropical Research Institute, and several years of work by the office culminated successfully in foundation support for an important manual on handling wild mammals in captivity at the National Zoological Park. The office began an effort to secure \$1.5 million to endow research on ticks at the National Museum of Natural History.

As the new decentralized development organization takes shape, with more bureaus and offices establishing their own staffs, the research and record-keeping functions of the Development Office will be expanded accordingly. The Secretary's Development Committee will meet regularly to decide on project priorities and to coordinate all Institution fund-raising efforts.

James Smithson Society

The James Smithson Society was founded in 1977 as the highest level of the Contributing Membership of the Smithsonian Associates. Since then, the Smithson Society has granted more than \$1,800,000 in support of Smithsonian projects and acquisitions. This year, through the contributions of Annual Members, the Society made awards totaling \$288,900 to the following: partial funding for two exhibitions at the National Museum of American Art, *The Art of John La Farge* and *Unknown Territory: Photographs by Ray Metzker*; support to the National Museum of American History for the expansion of a data base of Afro-American-related items in Smithsonian collections; a three-to-one challenge grant towards the Cooper-Hewitt Museum's capital campaign for renovation and construction; the Office of Horticulture for the duplication of the Garden Club of America's "Notable American Parks and Gardens" slide collection onto optical discs; acquisition monies to the National Portrait Gallery to acquire a portrait by Stanton MacDonald-Wright of the artist's brother, Willard Huntington Wright; support to the Office of Symposia and Seminars to publish *The Canvas of Culture*, a symposium volume based on contemporary issues in India; to the Visitor Information and Associates' Reception Center, funds towards the Kresge Foundation challenge grant to build a new Smithsonian Information Center; and in cooperation with the Office of Telecommunications, support for the production of a Smithsonian Institution orientation video; to the National Air and Space Museum, monies to conserve rare aviation posters and historic aviation newsreel footage, and support to carry out research on the evolution of the inland Niger Delta; partial funding to the Smithsonian Astrophysical Observatory to mount an exhibition of computer-generated images; to the National Museum of Natural History, support towards the exhibition *Through the Paleontological Looking Glass* (a working vertebrate paleontology laboratory) and restoration funds for the newly acquired Chinese *Hell Scrolls*, an important set of Chinese folk paintings; and finally, support to the Smithsonian Tropical Research Institute to conduct further research on iguana management.

The annual weekend for members of the Smithson Society, held every year in conjunction with the autumn meeting of the National Board of the Smithsonian Associates, took place September 26 and 27. At a formal dinner held at the National Museum of Natural History, National Board Chairman Seymour H. Knox III announced the 1986 Smithson Society grants. On the morning of September 27, spouses of the National Board



The exhibition *Art in New Mexico* at the National Museum of American Art was previewed in March 1986 by upper-level donors of the Smithsonian's Contributing Membership Program.

and Smithson Society members participated in a behind-the-scenes tour of the U.S Supreme Court. Following the tour, Smithson Society and National Board members attended a luncheon in their honor at the John F. Kennedy Center for the Performing Arts.

National Board of the Smithsonian Associates

Chairman Seymour H. Knox III organized the April meetings of the board in Buffalo. At the first meeting, members and their spouses heard from Ann Leven, treasurer of the Institution, and from Peggy Loar, director of the Smithsonian Institution Traveling Exhibition Service. The second meeting afforded Secretary Adams an opportunity to express his views on important issues facing the Institution.

New members elected to the board at the April meeting were Philip F. Anschutz (Denver, Colorado), George B. Bingham, Jr. (Louisville, Kentucky), Jeffrey Cole (Lyndhurst, Ohio), Gerald D. Hines (Houston, Texas), Sidney R. Peterson (Toluca Lake, California), and Mrs. James M. Walton (Pittsburgh, Pennsylvania).

The autumn meetings were held in Washington, D.C., on September 26 and 27. Sylvia Williams, director of the National Museum of African Art, updated members on plans for major acquisitions and for the new space in the quadrangle; this was followed by an overview of the Institution's museums presented by Tom Freudenheim, Assistant Secretary for Museums. On September 27, Secretary Adams gave the board his semiannual report and answered questions, providing the members with an opportunity to discuss areas of interest. Mr. Charles D. Dickey, Jr., was elected by the board to serve as chairman, beginning January 1, 1987. The weekend also included the joint National Board-James Smithsonian Society dinner on September 26 at the National Museum of Natural History. Members of the James Smithsonian Society and spouses of the National Board members were treated to a behind-the-scenes tour of the U.S. Supreme Court on the morning of the twenty-seventh prior to the closing luncheon at the John F. Kennedy Center for the Performing Arts.

Smithsonian National Associate Program

Since its inception in 1970, the Smithsonian National Associate Program, in cooperation with other Smithsonian bureaus, has provided innovative educational opportunities for Smithsonian Associates throughout the nation. Through *Smithsonian* magazine, members join activities which increase their awareness of the Institution and encourage support for its work. The three units which compose the National Associate Program, now serving more than 2,000,000 members, offer benefits which are directed toward increasing members' personal involvement with the life of the Smithsonian.

Contributing Membership Program

The Contributing Membership of the National Associate Program provides unrestricted funds for Smithsonian research, education, and outreach programs through six levels of annual membership: Supporting (\$50), available only to members who live outside the greater Washington, D.C., metropolitan area; Donor (\$100); Sponsoring (\$250); Sustaining (\$500); Patron (\$1,000); and the James Smithsonian Society (\$1,500).

The program was established in 1976, and membership has grown steadily over the past decade. At the end of fiscal year 1986, there were 41,000 members, a 27 percent increase over fiscal year 1985. Membership is national; 88 percent of the constituency resides beyond the Washington, D.C., metropolitan area. Income from membership dues, special fund-raising contributions, and corporate matching funds also continued to grow, reaching \$3,800,000 in fiscal year 1986, 23 percent more than in the previous year.

The Institution expresses appreciation by presenting to Contributing Members a variety of benefits, including invitations to special exhibition previews and receptions. Nine such special events were held in fiscal year 1986, including viewings of the exhibitions *Magnificent Voyagers: The U.S. Exploring Expedition 1838-1842*; *Hollywood: Legend and Reality*; and *After the Revolution: Everyday Life in America, 1780-1800*; special screenings of the new IMAX film *On the Wing* at the National Air and Space Museum; and an exclusive evening of Japanese performances and food at the Japan program of the 1986 Festival of American Folklife. Members were invited to the Navy Memorial Museum of the Washington Navy Yard and to the 1986 National Heritage Fellowships Program, the National Endowment for the Arts' annual presentation of America's foremost folk artists and artisans. Upper-level donors enjoyed receptions



Bob O'Donnell, lecturer, Smithsonian National Associates Lecture and Seminar Program, is seen here with a young student during the Fossil Identification workshop in Laramie, Wyoming, October 1985. (Photograph by Karol Griffin)

and viewing of the exhibitions *Selections from the Joseph H. Hirshhorn Bequest* at the Hirshhorn Museum and Sculpture Garden and *Art in New Mexico* at the National Museum of American Art, and received tickets to the National Gallery of Art's *Treasure Houses of Britain* exhibition.

In 1986, complimentary publications issued to members included *Magnificent Voyagers*, published by the Smithsonian Institution Press to accompany the National Museum of Natural History's major exhibition, and *Flight of the Pterosaurs* and *Treasures from the National Museum of American Art*, also Smithsonian Institution Press publications. Additionally, the *Smithsonian Engagement Calendar*, produced by Smithsonian Product Development and Licensing, is mailed each year to all Contributing Members. Because the Contributing Membership Program can guarantee large press runs,

bureaus can issue quality publications at significantly lower prices.

In a similar cooperative manner, Contributing Members within the Washington metropolitan area are enrolled automatically in the Resident Associate Program, thus supporting its monthly newsletter and classes. Members outside this area receive *Research Reports*, published three times a year by the Office of Public Affairs to highlight special research and educational projects under way throughout the Institution.

Through the *Smithsonian Treasures* annual tour designed by the Associates Travel Program, Contributing Members enjoy an exclusive behind-the-scenes five-day visit to the Institution. And, during the course of Lecture and Seminar Programs in communities nationwide, Contributing Members are offered priority registration, complimentary tickets to one lecture, and often an invitation to an accompanying informal reception. Such special treatment reinforces the message that Contributing Members are important to the Smithsonian and forwards the development of a loyal national constituency responsive to future fund-raising appeals.

Lecture and Seminar Program

The Lecture and Seminar Program, established in 1975, takes Smithsonian-originated educational programs to approximately twenty cities in the United States each year. Under the sponsorship of the Lecture and Seminar Program, Smithsonian scientists, curators, and scholars travel to selected cities to present series of lectures, seminars, and hands-on workshops designed to better acquaint National Associate members, members of cosponsoring organizations, and the general public with the research and activities of the national museum. Each series is specifically designed to meet the interests of individual communities. Events have been held in every region of the country, from major metropolitan areas to small communities. Included in each series are programs designed to meet the interests of adults, children, and family groups. In addition to bringing Smithsonian programs to members throughout the country, the Lecture and Seminar Program invites National Members to study with Smithsonian curators during week-long seminars in Washington, D.C. The Washington seminars, highlighting Smithsonian collections, combine lectures with behind-the-scenes tours of Smithsonian museums.

During 1986, more than 445,000 families were invited to attend more than 200 Smithsonian events across the



Smithsonian Associates visit Iguacú Falls, Brazil, during an epic study-voyage around Cape Horn.

country. This year, for the first time, the Lecture and Seminar Program visited Laramie and Cheyenne, Wyoming; Syracuse and Buffalo, New York; Sarasota, Florida; Pasadena, California; Reno, Fallon, and Carson City, Nevada; Charleston, West Virginia; Berkshire County, Massachusetts; Aiken, South Carolina; and Boone, North Carolina. The program returned to Albuquerque, New Mexico; Anchorage and Juneau, Alaska; Portland, Oregon; Tucson, Arizona; and San Diego, California. Proclamations honoring the Smithsonian visits were issued by the mayors of Pasadena, Tucson, Cheyenne, and Boone.

The Lecture and Seminar Program cooperated with more than 120 local organizations throughout the country this year, including museums, colleges, universities, and cultural centers. Several organizations continued to lend support on a national level, including United Airlines, EAA Aviation Foundation, the American Association of Retired Persons, the National Trust for Historic Preservation, World Wildlife Fund-U.S., and Sigma Xi, the Scientific Research Society.

Thirty-two new programs made their debut in the Lecture and Seminar Program during 1986. Among these were: "The Old Ship of Zion: An Evening of Afro-American Gospel Music" by Horace Boyer, National Museum of American History; "Animal Communication: Classic Studies and New Discoveries" by Michael Robinson, director, and other staff members of the

National Zoological Park; and "Man's Quest for Wings: Highlights of Aviation History" by E. T. Wooldridge, Claudia Oakes, and R. E. G. Davies, National Air and Space Museum, with Paul MacCready, designer of the *Quetzalcoatlus northropi*.

Five Washington seminars were held during the past year: "New Perspectives on American Art," "Anthropology at the Smithsonian," "Creative Writing," "Highlights of Aviation History," and "18th-Century Baroque Music." In January, under the auspices of the Lecture and Seminar Program, eleven British scholars traveled to the United States to conduct two weeks of specialized seminars to complement the exhibition, *Treasure Houses of Great Britain* at the National Gallery of Art. Associates from around the country came to Washington to attend seminars on painting, textiles, heraldry, pottery, and jewelry and to be guided through the exhibition by British experts.

In 1986, for the first time, the Lecture and Seminar Program initiated week-long residential seminars outside of Washington, D.C. This concept proved highly successful during its premiere in Boone, North Carolina. Smithsonian seminars, hosted by Appalachian State University, drew 130 members from thirty states to Boone to study fossils, creative writing, and American art in the serene setting of the Blue Ridge mountains.

After a successful debut of the Lecture and Seminar Program in Tokyo during 1985, plans are in progress for future international ventures.

Associates Travel Program

The Associates Travel Program presents educational study tours that mirror the interests and concerns of the Institution. Tours are designed for members who are particularly interested in the work of the national museum and the subjects in *Smithsonian* magazine. The educational content of both foreign and domestic tours is enhanced by study leaders, and each trip is attended by one or more Smithsonian staff members. Since 1975, more than 66,000 members have participated in study tours throughout the world; in 1986, 6,600 members traveled on 105 programs.

This year, National Associates chose from forty-one Domestic Study Tours to all parts of the United States. Domestic cruises continued to grow in popularity. In September the *Delta Queen* steamed down the Ohio River from Cincinnati to St. Louis, docking at cities and historic sites along the way. While cruising Alaska's In-

side Passage, Associates were thrilled to see humpback whales and glaciers at close range. Perhaps the most spectacular cruise of the year was in New England and on the Hudson River, with two days in New York Harbor for the festivities celebrating the unveiling of the Statue of Liberty.

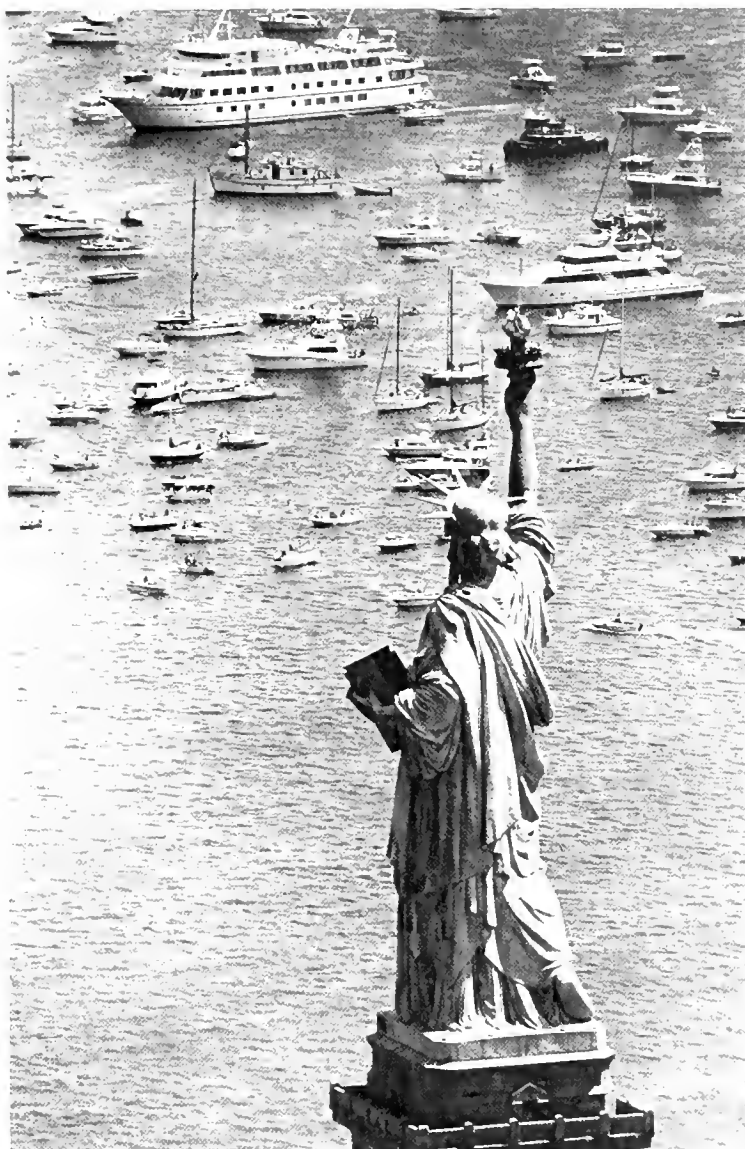
Land trips were offered to a variety of destinations across the country, covering subjects such as architecture, history, and current cultural trends. A program to south Louisiana introduced members to Cajun food and music. While tracing Colorado's mining and railroad history, members explored the San Juan mountains by jeep and narrow-gauge railroad. Antiques and historic homes highlighted a tour to Wilmington, Delaware, and to the Brandywine Valley in Pennsylvania.

Associates continue to seek the adventure and wonder of the outdoors. The most popular natural history programs took participants to national parks such as Arches, Canyonlands, Bryce, and Zion. Some members studied the ecosystems of tidal pools along the coast of Maine while others explored the deserts of Arizona. Associates also joined archaeologists in Cortez, Colorado, to dig for artifacts at an Anasazi Indian site.

More than 3,000 members participated in "Washington Anytime Weekend," designed to give members an opportunity to visit the nation's capital and the Smithsonian any weekend during the year. The program is executed in cooperation with the Visitor Information and Associates' Reception Center, which provides a behind-the-scenes tour of the Castle and is available for information and guidance during weekends. A new feature added this year was a viewing of a National Air and Space Museum IMAX film.

Foreign Study Tours continued to serve the diverse interests of National Associates by offering a variety of activities and destinations. New tours included "Backstage London" with backstage visits and discussions relating to performances. In the Dordogne region of France, members visited outstanding prehistoric caves, as well as fortified towns, monasteries, and castles dating to the Middle Ages. A decorative arts and design program included special lectures and demonstrations at museums and ateliers in Copenhagen, Stockholm, and Helsinki.

Associates retraced the routes of Magellan, Drake, and Darwin on a history-making expedition, sailing from Rio, around Cape Horn, through the Beagle Channel and the Strait of Magellan, and north through Chile's inland waterway to Puerto Montt. On board ship, they learned about the geology, flora, and fauna of the area



Smithsonian Associates, aboard the *Nantucket Clipper* (large craft at top), had a prime spot for viewing the Statue of Liberty festivities in July 1986. (Photograph by Lucian Perkins, *The Washington Post*)

and discussed history and current politics of Latin America. On shore, they traveled by chartered train and plane to Iguacu Falls, observed a penguin colony at Punta Tombo, and visited local museums in Punta Arenas and Ushuaia. On other study voyages, Associates studied history and literature while circumnavigating the British Isles, focused on art and architecture on a journey around Italy from Venice to Genoa, discussed marine biology and maritime history on the fifth annual Atlantic crossing, and learned about cultural and artistic traditions of Borneo, the Moluccas, and Papua New Guinea.

China continued to be popular with 430 members traveling on fifteen tours. The Yangtze River tours were in great demand, as were "Decorative Arts and Antiques," "China by Train," and "Hiking the Sacred

Smithsonian Resident Associate Program

Peaks of China.” In addition to China, outdoor enthusiasts hiked in the Black Forest of Germany, along New Zealand’s famed Milford Track, and through the north central Highlands of Scotland.

On an epic journey of 7,436 miles, seven countries, and two continents, National Associates traveled from Paris to Shanghai by train with visits to Berlin, Moscow, Irkutsk, Ulan Bator, and Beijing. Other Smithsonian travelers entered Tibet via China, and, after a week’s stay in Lhasa and Xigazê, traveled by jeep on the rugged overland route from Tibet to Kathmandu, Nepal.

Countryside programs allowed members to live in small towns in Italy, England, Austria, and Switzerland. Residential seminars included history and art in Florence, and the eighth annual Oxford/Smithsonian Seminar, which offered specially designed courses in the arts and sciences. In late summer, ninety-five members participated in the Smithsonian’s first Volga Seminar. After traveling in three separate groups focusing on art and architecture, history, or present-day concerns in the Soviet Union, members joined together for a ten-day Volga cruise with lectures and language classes on board and activities and visits each day on shore.

The Smithsonian National Associate Program continues to increase services to its members as it encourages private support for the Institution. Inherent in the approach of the program is an emphasis on educational pursuits, member participation, public awareness, and cooperation with Smithsonian bureaus and like-minded organizations nationwide.

The Resident Associate Program (RAP) is a model for museum and university programs nationally and internationally. RAP’s mission is to support the work of the Institution and to engage residents of the greater Washington area in the life of the Smithsonian by complementing the Institution’s collections, exhibitions, and research; presenting educational and cultural programs consistent with the Institution’s interests; collaborating with international, national, and local institutions to reach broader audiences; and serving and retaining members as well as attracting new members. To meet these objectives, RAP offered nearly 2,000 innovative, high-quality, timely activities attended by more than 270,000 adults and young people.

Fiscal year 1986 was a success. With an increased membership, higher retention rate, and larger registration income than in the previous year, RAP continued to be self-supporting, except for Discovery Theater and performing arts activities, which are mandated to receive subsidy from the Institution. Total membership exceeded 57,000 with a retention rate of over 80 percent. Small grants from local and national foundations and corporations enabled RAP to carry out special outreach projects and other activities otherwise not possible; through the commission and sale of a serigraph by the late Gene Davis, RAP realized income to support the renovation of the Discover Graphics studio.

Cooperation with Smithsonian Bureaus and Major Offices

During fiscal year 1986, RAP cosponsored two lectures with the National Portrait Gallery: “American Heiresses Become British Brides” by British biographer Nigel Nicolson and “The Washingtonians: Intimate Portraits” by American historian Gary Wills. RAP and the National Portrait Gallery also cosponsored two “Portraits in Motion” performances. A two-day seminar with Stephen Jay Gould as one of the speakers, “Men of Daring, Triumphs of Exploration” was cosponsored with the National Museum of Natural History in conjunction with the exhibition *Magnificent Voyagers: The U.S. Exploring Expedition, 1838–1842*. Some Discovery Theater programs, such as “Exploring the Smithsonian,” were cosponsored with the National Museum of Natural History, as were Black History Month performances such as “Memory of African Culture,” organized by Discovery Theater. The Hirshhorn Museum and Sculpture Garden and RAP have continued to cosponsor the 20th Century Consort series,

and in addition three lectures: "Sandro Chia and Howard Fox: A Dialogue," "The Ceramic Sculpture of Robert Arneson," and "My Life with Joe" by Olga Hirshhorn. The various Smithsonian chamber music series continued under National Museum of American History and RAP cosponsorship. The Chesapeake Bay Environmental Research Center of the Smithsonian collaborated on naturalist tours by providing staff scientists for tour leaders. Programmatic cooperation with the Smithsonian Institution Traveling Exhibition Service and staff participation as lecturers in Office of Museum Programs workshops were ongoing. The director continues to serve as senior advisor to the Office of Museum Programs Kellogg Project. Courses and lectures are regularly planned in collaboration with the Woodrow Wilson International Center for Scholars, such as "The Soviet Union Under Gorbachev," a lecture by Peter Reddaway, program secretary of the Kennan Institute for Advanced Russian Studies; and the courses "Marxism and Ideology of Socialism," taught by Woodrow Wilson Fellow Svetozar Stojanovich, and "The Phillipines: Turmoil in the Pacific," cosponsored with the Asia Program of the Woodrow Wilson International Center for Scholars.

Outreach

The Discover Graphics program affords talented area public high school students and their art teachers the free opportunity to learn etching and lithography, using fine Smithsonian presses. Now in its third year, Discover Graphics has enabled over 200 participants annually to receive studio training, combined with Smithsonian museum visits and the loan of portable presses to the schools. A student exhibition of selected prints, juried by Smithsonian curators and held during summer 1986 at the National Museum of American History, was partially underwritten by a grant from the Women's Committee of the Smithsonian Associates. Owing to the spring 1986 closing of the Lansburgh Center, Discover Graphics left the studio space where it had been housed for the past two and one-half years. While it is temporarily housed at the 19th and K Streets space of the Union Printmakers, plans are under way for the renovation of existing studio space in the Arts and Industries Building to provide a new permanent home on the Mall for this valuable outreach program.

Scholarships were awarded, through the public school system, to fifty-eight inner city young people and seventy-four adults to attend Young Associate and adult

courses this fiscal year. In addition, five inner-city young people served as youth teacher assistants for Young Associate Summer Camp, under the auspices of the Smithsonian Career Awareness Program.

The twentieth annual Kite Festival took place on the Mall in March, with 1,200 persons in attendance.

Especially designed to appeal to retired people, "Tuesday Mornings at the Smithsonian" is a daytime weekly lecture series. The thirty-two lectures by Smithsonian scholars attracted 8,200 participants this year.

Singles Evenings at the Castle was initiated in fall 1985 for working singles. This series of lectures by Smithsonian scholars was very well received. In fiscal year 1986, a total of twenty-four lectures were attended by 3,800 participants; registration was restricted to 100 men and 100 women so that the evenings could combine discussion about the lecture and the opportunity to socialize.

Collaboration with Community, Regional, National, and International Organizations

For the thirteenth consecutive year, RAP cosponsored ten monthly lectures with the Audubon Naturalist Society and the Friends of the National Zoo. This year's series attracted more than 10,500 persons. RAP collaborated with organizations such as the American Institute of Architects and the AIA Foundation; Washington-Alexandria Center for Architecture; Virginia Polytechnic Institute and State University; Pennsylvania Avenue Development Corporation; D.C. Preservation League; Art Directors Club of Metropolitan Washington; Federal Design Council; American Institute of Graphic Arts; American Society of Interior Design; Metropolitan Chapter, Council for the Advancement and Support of Education; Meridian House International; National Park Service; Pro Musicis Foundation; District Curators; World Folk Music Association; National Institutes of Health; International Poetry Forum; and D.C. Library Association. The Baltimore-D.C. Institute for Psychoanalysis cosponsored the film series "Creativity and Fantasy: A Psychoanalytic Interpretation of Film"; the National Geographic Society cosponsored the six-part lecture series "Explorers in the Modern Era"; the James Renwick Collectors' Alliance cosponsored the all-day seminar "Living with Wood"; and St. John's College, Maryland, cosponsored "St. John's Seminar: Classical and Modern Concepts of Man and Society."

Many lectures, courses, films, and performances were

planned in collaboration with foreign embassies and international societies: "The Discerning Traveler in China"; "Study and Tour of Norway"; "New Zealand: New Perspectives"; "The Discerning Traveler in Ireland"; "Indonesia: The Golden Isles"; the seminar "Budapest and Vienna: Jewels on the Danube"; the film *Rembrandt the Drawer* and the performance "Jazz Goes Dutch" by Willem Breuker Kollektief. The "Classic Japanese Theater: The Great Traditions of *Noh* and *Kyogen*" was cosponsored with the Japan-America Society of Washington and the studio arts course, "A Master Demonstrates the Art of Japanese Embroidery: Shuji Tamura" with the Kurenai-Kai School of Embroidery, Chiba, Japan.

Telecommunications

During fiscal year 1986, the course "Ascendancy of Asia: The Pacific Community in the 21st Century," organized in conjunction with the Woodrow Wilson Center's Asia Program and the Asia Foundation, was videotaped for distribution to national and international audiences in the coming year. WORLDNET, the U.S. Information Agency's telecommunications system carrying programs abroad by satellite and seen through U.S. embassy posts, and RAP collaborated on twelve programs in fiscal year 1986. Seven RAP programs were on *Almanac*, ranging from the performance of Billy Taylor to the Kite Festival on the Mall to an interview with Julia Child. The *Arts America* program featured three RAP performances.

Programs

Courses

Four terms per year, RAP presents higher education courses providing educated adults an opportunity to study with Smithsonian and visiting scholars. In fiscal year 1986, over 200 lecture courses were scheduled, and attendance at single lectures reached 56,000. Among the most popular were: "Masters of Portrait Photography," featuring presentations by Yousuf Karsh, Annie Leibovitz, and Helmet Newton; "Literary Evenings: Writers on Writing" with Pulitzer prize winner Larry McMurtry, Peter Benchley, Martin Cruz Smith, and Jean Auel; and "Origin of the Universe," including physicist Alan Guth. The RAP course "American English in Washington,

D.C.," planned for the international and diplomatic communities, attracted nationwide attention.

The studio arts program enhances appreciation of age-old crafts and introduces contemporary crafts. In all, over 300 courses and workshops were presented, with an attendance of nearly 15,000. Guest instructors included Unichi Hiratsuka, Japanese woodcut master; Jef Van Grieken, Belgian painter; and Shou-chen Zhang, master painter from the People's Republic of China. Courses ranged from "Celestial Photography" (with an eye to Halley's comet) and "How to Design and Build a Light Aircraft" to more traditional art forms such as "Painted Trompe L'Oeil Finishes," "The Shaker Oval Box," and "Furniture Design and Construction Techniques."

Lectures, Seminars, and Films

Single lectures, intensive one- and two-day seminars, and scholarly symposia addressed a wide range of cultural topics. Individual films and film series featured U.S. or Washington premieres, foreign cultures, or salutes to well-known artists.

Notable speakers appearing at the Smithsonian under RAP auspices in fiscal year 1986 included economist John Kenneth Galbraith, scientist Jonas Salk, astrophysicist Charles Townes, the Honorable A. Leon Higginbotham, sociologist and writer Nathan Glazer, pilot Chuck Yeager, author Sheila Graham, biographer of Isak Dinesen, Judith Thurman, Titanic discoverer Robert Ballard, and engineer Paul MacCready. A total of 33,600 participants attended the 130 lectures offered.

More than 1,600 Resident Associates participated in eighteen all-day seminars. Some of the more notable seminars included "The High Drama of the Ottoman Sultans," "Biotechnology: Risks and Rewards," "The Splendor of Versailles," and "Human Origins and the Environment."

Among the over sixty films shown during the year, to audiences totaling 13,000, were the American premieres of the documentaries *A Thousand Cranes* and *Rembrandt the Drawer*. Washington film premieres included the award-winning Canadian movie, *My American Cousin*, *Bronte*, and a film series celebrating the Festival of India.

Performing Arts

In its third year of sponsoring ticketed Smithsonian performing arts events, RAP presented over 140 events at-

tended by 32,400 persons. Highlights of the season were visits by international ensembles such as the Hanover Band of London, the Willem Brueker Kollektief from Amsterdam, the Nagauta To-On-Kai from Japan, and the Ganelin Jazz Trio from the Soviet Union, in its first North American tour, as well as individual artists such as Canadian harpsichordist and scholar Kenneth Gilbert. The jazz series explored the musical legacies of Jelly Roll Morton, Fats Waller, Horace Silver and Tadd Dameron, and the legendary Thelonious Monk in four performances assembled and narrated by Martin Williams, jazz expert and editor at the Smithsonian Institution Press. Jazz legend Billy Taylor saluted Black History Month in his February concert.

The wide range of performances included magician Harry Blackstone, Jr.; Spanish dance scholar and teacher Marina Keet and the Spanish Dance Society USA; and the avant-garde theatrical magic of The Impossible Theater. During this year RAP inaugurated with the Pro Musicis Foundation a series of concerts by emerging young performers, and continued the series of poetry readings combined with musical presentations in collaboration with the International Poetry Forum. Resident Associates were offered a variety of classical and contemporary chamber music programs by the Emerson String Quartet, 20th Century Consort, Smithson String Quartet, Smithsonian Chamber Players, and Smithsonian Chamber Orchestra.

Study Tours

On-site learning experiences, lasting from one hour to three days, are organized for small groups in the fields of art, architecture, archaeology, history, industry, and science. Unique tours include visits to private sites organized in cooperation with local historical societies and private collectors such as the "Barnes and Arensberg Collections" and "Autumn at Winterthur and Eleutherian Mills," and the popular Frank Lloyd Wright's Fallingwater. Cooperative efforts with other agencies have resulted in programs such as the Mall wetland ecology walks led by National Park Service scientists. Initiated in 1984-85, the tours for working singles, such as the "Insomniacs Tour of Baltimore," have increased in popularity. Throughout the year, 557 tours—all kept small for maximum learning experience—attracted a total of 18,000 participants.

Young Associate and Family Activities

Through Young Associate and Family Activities, young people ages four to fifteen can participate in the life of the Smithsonian. Workshops, classes, monthly free films, tours, performances, and family lecture programs cover the disciplines of art, humanities, and sciences. Adult/child workshops and classes provide dynamic learning opportunities. Summer Camp sessions are team-taught by teachers of different disciplines. A Family Halloween Party is held in a different museum each year; a winter film and reception are planned in conjunction with the *Trees of Christmas* exhibition in the National Museum of American History; and an Evening at the Zoo is scheduled each summer, accompanied by live musical entertainment and private viewings of animal feedings. Over 160 Young Associate and Family Activities programs attracted an attendance of more than 15,000 individuals this year.

Discovery Theater presents entertainment and educational experiences for young people and their families, October through June. Live theatrical performances are presented twice a day, Tuesday through Saturday, with extra performances during Black History Month. Over 65,400 individuals attended 370 performances during the season. A new series of performances, designed solely for preschool children in the early afternoon in the months of November and March, was instituted.

Volunteers

More than 400 volunteers provided invaluable assistance. The ninety-seven volunteer office workers and activity monitors represented the equivalent of 19.1 full-time staff members; office volunteers represented 9.1 full-time staff. All volunteers were honored for their contributions at a reception in the Arts and Industries Building Rotunda on September 4.

Women's Committee of the Smithsonian Associates

The sixty-four active and fifty-nine resource members of the Women's Committee of the Smithsonian Associates continued to advance the interests of the Smithsonian through fund-raising, special projects, and hospitality on a volunteer basis. The members of the committee gave more than 7,100 hours of their time to the Smithsonian in fiscal year 1986. The committee awarded \$93,162 to thirty-nine projects in seventeen museums and bureaus. These monies were the net proceeds made available by the 1985 Christmas Dance and the 1985 Washington Craft Show. Projects were supported in amounts from \$500 to \$5,000.

The National Zoological Park received funding for a digitizer to analyze weaning of sea lion pups; a micro-computer for the Captive Breeding Program; the compilation of a bibliography of children's books about zoos; a small mammal management and husbandry audiovisual archives; video recording equipment for BIRDlab; the initiation of a program to monitor reproductive cycles of endangered hoof stock at Front Royal, Virginia; a real-time analyzer for research in vocal communication of animals; the publication of a study of disease processes in zoo animals; video recording equipment to study Guam rails and kingfishers; and continued support of graduate student stipends for the reproductive physiology program.

Additionally, the National Museum of American History received funds for the publication of the out-of-print educational brochure *Go*; a film series of programs interpreting the history of science and technology; a Black American composers concert; the conservation of paintings from the Division of Domestic Life; a photographic record of 600 pieces of ethnic women's costumes from eastern Europe; a videodisc of the Donald Sultner-Welles Photography Collection; a data-base system to organize documents relating to the work of Robert Mills; and a pamphlet for the Hall of Postal History.

The National Air and Space Museum was given funds to catalogue its collection of archival videotapes and films; for a series of seminars on the history of technology for universities nationwide; for the purchase of presentation slide generator and software for instant generation of color slides; and for personnel to copy selected portions of James Webb's papers at the Truman Library. Funding was granted to the National Museum of Natural History for diving equipment for research in Belize and Chinese botanical and horticultural literature translations. The National Portrait Gallery was granted monies to copy the Gilbert Stuart portrait of Thomas Jeffer-



The Women's Committee of the Smithsonian Associates held its fourth annual Washington Craft Show on April 18–20, 1986, in the Departmental Auditorium.

son and also to experiment with a system developed by NASM for collections documentation.

In other areas, funding was made available to the Hirshhorn Museum and Sculpture Garden for a docent enrichment seminar; to the Freer Gallery to purchase Chinese K'ang-hse-period porcelain; to the Smithsonian Institution Traveling Exhibition Service to plan an exhibition on the Space Shuttle and to help in the production of a new version of exhibition entitled *Know What You See: The Examination and Treatment of Paintings*; to the Cooper-Hewitt Museum to subsidize school group tours; to the Smithsonian Institution Libraries for the preservation of historical photographs; to the Office of Horticulture for an intern for the Fragrant Garden; and to the Office of Folklife Programs for the production of the booklet *Aditi and the Mela: Festival of India Exhibitions at the Smithsonian Institution*. In addition, funding was awarded to the Office of Fellowships and Grants for a slide presentation, *Research Opportunities at the Smithsonian*; to the Resident Associate Program for continued support of its Discover Graphics project; to the Office of Exhibits Central for graphics software and training; and to the Conservation Analytical Laboratory.

One hundred artists from twenty-seven states partici-

pated in the fourth annual Washington Craft Show held April 18–20, 1986, in the Departmental Auditorium. The artists were selected by three jurors: Cynthia Bringle, a distinguished potter from Penland, North Carolina; Arline Fisch, jeweler and professor of art at San Diego State University, California; and Lloyd Herman, director of the Renwick Gallery. Over 15,000 people attended the show; sales were up substantially from the previous year. As in the past, a preview fund-raising party was held on April 17. A silent auction, organized by the resource members of the committee, was held at the Departmental Auditorium concurrently with the Craft Show. A High School Craft Competition for the District of Columbia and six surrounding school districts was held to recognize quality student work and offer young artists contact with some of the country's finest craftsmen.

In November, three members of the Women's Committee opened their homes to ninety Contributing Members visiting Washington for a special behind-the-scenes Smithsonian tour.



UNDER SEPARATE
BOARDS OF
TRUSTEES

John F. Kennedy Center for the Performing Arts

Roger L. Stevens, Chairman

The John F. Kennedy Center for the Performing Arts, organized by an act of Congress in 1958 as a self-sustaining bureau of the Smithsonian Institution, is both a presidential memorial under the aegis of the Department of the Interior and a privately supported performing arts center directed by a board of trustees whose thirty citizen members are appointed by the President of the United States. Six congressional representatives and nine designated ex officio representatives of the executive branch complete the membership of forty-five. This annual report of the Kennedy Center's activities encompasses all the programming presented not only in its five theaters but also around the nation through its touring and education programs.

Unlike many regional performing arts centers, the Kennedy Center, as the national cultural center, is specifically directed by its authorizing legislation to develop and present a broad array of performing arts programming—including theater, music, opera, ballet, dance, and educational and public service activities—in Washington, D.C., and across the country to provide the greatest possible public access. Since no direct federal appropriations are provided, the fulfillment of this congressional mandate is made possible by earned income, primarily from ticket sales, and by the contributions of millions of dollars from the private sector. The Kennedy Center's future and long-range artistic programming, though, are partially secured financially through an ongoing endowment campaign begun in 1985.

This year marked the fifteenth anniversary of the Kennedy Center's opening to the public—a landmark witnessed by a remarkable increase in the number of free performances given here by the Education Program and the American National Theater, as well as a higher total of young people attending them. The music season was highlighted by an expanded calendar of events capped by the affiliation of the Kennedy Center and the National Symphony Orchestra at the end of the year. The affiliation is designed to help secure the NSO's long-range financial future and continued artistic excellence while enhancing the Kennedy Center's broad national mandate to present and foster the finest in all the performing arts.

Performing Arts Programming

The 1985–86 season at the Kennedy Center was attended by 1,189,185 people in the Opera House, Concert Hall, and the Eisenhower and Terrace theaters. And an unprecedented 99,253 people attended the free performances

in the Free Theater/Theater Lab, Holiday Festival, Friends of the Kennedy Center Open House, and other events throughout the year.

Drama and Musical Theater

The 1985–86 theater season began with the critically acclaimed one-woman drama, *Lillian*, which brought to life the works, the times, and the person of Lillian Hellman through Zoe Caldwell's powerful performance. The season closed with a revival of Rodgers and Hammerstein's *Carousel* and William Gibson and Joe Raposo's new musical *Raggedy Ann*. During the season there were faithful revivals of several favorites—Noel Coward's *Hay Fever*, Herman Wouk's Pulitzer prize-winning *The Caine Mutiny Court-Martial*, and Frederick Lonsdale's stylish *Aren't We All?* Also of note was Martha Clarke's expressionistic theater piece from the New York Shakespeare Festival, *Vienna: Lusthaus*.

The American National Theater (ANT), under the auspices of the Kennedy Center, began its ambitious season with adventurous interpretations of two twentieth-century classics—Anton Chekhov's *A Seagull* and Robert E. Sherwood's *Idiot's Delight*—both directed by ANT director Peter Sellars. As part of its international and regional companies series, ANT hosted several distinctive theater groups, which provided a unique opportunity to sample the astonishing range of theater from around the world. New York's Wooster Group presented three group-created, fully staged works-in-progress (two of them free to the public). The Squat Theater, also from New York and free of charge, presented the multimedia *Dreamland Burns*. Dario Fo and Franca Rame, stars of the Italian stage, each presented a one-person spectacle in the Free Theater. The Haifa Municipal Theater presented two works in Hebrew and an Arabic language production of Athol Fugard's *The Island*. And the Wilma Theater of Philadelphia offered its multimedia staging of George Orwell's *1984*.

Also, the American National Theater and California's La Jolla Playhouse each created a production—*Ajax* and *Shout Up A Morning*, respectively—which premiered in its own city and then was traded in a unique transcontinental theatrical exchange as part of the ongoing AT&T Performing Arts Festival at the Kennedy Center. To close the American National Theater season, Richard Thomas, who had performed the leading role in ANT's production of *The Count of Monte Cristo* the previous season, returned with David Warrilow to play in *Two*

Figures in Dense, Violet Light, Peter Sellars's final production before a sabbatical.

The list of outstanding performers who participated in this diverse season included Zoe Caldwell, Claudette Colbert, Ben Cross, Colleen Dewhurst, Roy Dotrice, Rosemary Harris, Rex Harrison, Charlton Heston, Stacy Keach, Werner Klemperer, Kelly McGillis, Milo O'Shea, JoBeth Williams, and Tom Wopat.

Dance

The 1985–86 ballet season saw the Washington debut of the historic Paris Opera Ballet and the return of several favorite companies.

After a season's absence, the New York City Ballet launched the Ballet in America season that included Washington premieres by Jerome Robbins (*In Memory Of . . .*) and Peter Martins (*Poulenc Sonata*). Stuttgart Ballet resumed the tradition of presenting international companies at the Opera House, returning to Washington for the first time since 1980 with a controversial, full-length *A Streetcar Named Desire*. The season ended with the Paris Opera Ballet's Washington debut in dance director Rudolf Nureyev's staging of *Swan Lake*. American Ballet Theatre, Houston Ballet, the Joffrey Ballet, and the Dance Theatre of Harlem rounded out the season.

Ballet programs were complemented by contemporary and ethnic dancing. Dance America, sponsored jointly by the Washington Performing Arts Society and the Kennedy Center, brought some of the country's most important modern dance ensembles to the nation's capital. Also the Antologia de la Zarzuela presented genuine Spanish folk and classical dancing at the Opera House; and the American Ballroom Theater simultaneously turned the Terrace Theater into a nostalgic dance hall and vibrant showcase for the latest styles.

Music

Stars from around the world, as well as a host of talented emerging artists, were presented in several subscription series concerts and individual musical events throughout the year.

The annual Kennedy Center Friedheim Awards, designed to recognize and encourage the creation of new American music, resulted in the first tie for first place in the eight-year history of the awards. The winners this year were Robert Erickson's *Solstice* and Donald Martino's *String Quartet*.



Elisabeth Platel of the Paris Opera Ballet is shown performing in *Swan Lake* in July 1986 at the Kennedy Center Opera House.

The Kennedy Center Handel Festival celebrated its tenth anniversary concert performances with a reprise of the composer's popular *Saul* and the national premier of *L'Allegro, il penseroso ed il moderato*. The Terrace Concerts—composed of piano and vocal recitals, chamber ensembles and orchestras, the International Series, and the Young Concert Artists series—presented twenty-nine performances highlighted by the Dresden Chamber Orchestra, duo pianists Misha and Cipa Dichter, tenor Siegfried Jerusalem, the Romero Guitar Quartet, pianist David Lively, and an evening of music devoted to George Crumb, the country's foremost avant-garde composer, who appeared in person.

The number of pop acts appearing at the Kennedy Center increased, largely through the Summer Fun Festival. This year's line-up included a concert by recording artist Dionne Warwick and the Chinese Dragon Acrobats and Magicians of Taipei.

Theater Chamber Players, Mostly Mozart Festival, Choral Arts Society, Chamber Music Society of Lincoln Center, the Oratorio Society, and the Paul Hill Chorale returned for their annual subscription concerts.

And a multitude of free events, many featuring musicians from the Washington metropolitan area, took place thanks to the Holiday Festival in December and the Friends of the Kennedy Center's second annual open house, Inside/Out, in June.

Kennedy Center Associate Organizations

Many events that take place at the Kennedy Center are produced by one of the Center's artistic associates: the American Film Institute (AFI), which presents classic films, independent features, foreign films, and contemporary video works in its 224-seat theater; and the Washington Opera, which this season presented Mozart's *Don Giovanni*, Tchaikovsky's *Eugene Onegin*, and Verdi's *Un ballo in maschera* in the Opera House, and Donizetti's *Daughter of the Regiment* and Offenbach's *Christopher Columbus* in the Terrace Theater.

The National Symphony Orchestra (which completed its administrative affiliation with the Kennedy Center at the end of the year) presented twenty-nine different programs in twenty-eight weeks under the direction of Mstislav Rostropovich, including two world premieres and the American premiere of Krzysztof Penderecki's *Polish Requiem*.

In addition, the Washington Performing Arts Society presented an impressive array of music and dance performances throughout its nine-month season, including a one-week engagement of the Ballet of China on its premiere U.S. tour.

Public Service Programming

The Kennedy Center is specifically directed by Congress to carry out a broad range of educational and public service programs, including the activities of the National Program for Cultural Diversity, which is committed to encouraging programs that reflect our nation's cultural and ethnic diversity by sponsoring performances, com-



Rex Harrison and Claudette Colbert starred in Frederick Lonsdale's *Aren't We All?* at the Kennedy Center Opera House December 10, 1985, to January 6, 1986. (Photograph by Zoe Dominic)

missions, workshops, conferences, internships, and advisory and technical services in arts administration. With the exception of partial U.S. Department of Education funding for its national education efforts, these programs are supported by funds privately raised by the Kennedy Center. In fiscal year 1986, \$2.58 million was allocated from the Kennedy Center's private contributions for the support of the national education programs, cultural diversity activities and the privately subsidized presentation of theater, music and dance, including many free and low-admission performances and events enjoyed by more than a million people in Washington, D.C., and around the country. In addition, 16,178 people visited and used the Performing Arts Library.

Education Programming

As the national cultural center, the Kennedy Center has a responsibility to advance all the arts in the education of

the nation's youth. To meet this challenge in 1986, the Kennedy Center Education Program sponsored performances and other events that reached more than three million people nationwide through three components: the Alliance for Arts Education, the American College Theater Festival, and Programs for Children and Youth. These programs were supported in part by a generous grant from the U.S. Department of Education and major private support from the Kennedy Center Corporate Fund, as well as individuals, foundations, and other corporations. Each component works closely with Very Special Arts, an educational affiliate of the Kennedy Center.

Programs for Children and Youth is the production arm of the Education Program, providing more than 200 free performances and events to audiences of more than 60,000 at the Kennedy Center in 1986. Among these were the Cultural Diversity Festival and Imagination Celebration, the national children's arts festival.

Reflecting the Kennedy Center's commitment to develop new works for young people, Programs for Children and Youth commissioned three new works in 1986: *A Good Life*, *The Sorcerer's Apprentice*, and *Dick Whittington and His Cat*. Programs for Children and Youth also created a new Teen Acting Ensemble for advanced students and its first Summer Drama Workshop, which gave forty students between the ages of nine and nineteen three weeks of intensive professional theater training.

The Alliance for Arts Education is a national network of fifty-three committees in the states and special jurisdictions that develops and promotes the arts in the nation's educational systems. In 1986, seven arts educators were awarded Kennedy Center Fellowships for Teachers of the Arts, and a total of forty-five school principals and superintendents were cited for fostering the arts in their schools and school districts. Alliance for Arts Education also coproduced, along with the White House Commission on Presidential Scholars and the National Foundation for Advancement in the Arts, the presentation and performance of twenty Presidential Scholars in the Arts in the Concert Hall.

Nationwide, Alliance for Arts Education welcomed the participation of approximately 300,000 young people, families, and teachers at Imagination Celebration festival's twenty-five sites in thirteen states and the District of Columbia. The number of new festivals doubled. Festivals were held for the first time in Orange County, California; Colorado Springs, Colorado; Syracuse, Binghamton, and Buffalo, New York; and Portland, Maine.

For the eighteenth year, the American College Theater

Festival combined the efforts of theater educators and theater professionals to provide a national showcase for college theater. More than 13,000 students and 2,100 faculty members from nearly 500 schools participated in 1986. A record 587 college theater productions were entered and adjudicated at local levels; more than sixty were selected for twelve regional festivals. Six finalists—four of them original scripts, the highest number to date—were brought to Washington for the national festival at the Kennedy Center. Audiences across the country for all productions entered in the festival totaled more than one million.

The American College Theater Festival also cosponsored numerous awards programs in playwriting, design, criticism, acting, and theater administration. It cosponsored for the ninth year the Shenandoah Valley Playwrights Retreat in Staunton, Virginia, and selected nine college seniors for a career development symposium that culminated in showcases for producers and casting agents at the Kennedy Center in Washington and off-Broadway.

All components of the Kennedy Center Education Program are supported by an Educational Services division, which uses the performing arts resources at the Kennedy Center as the basis for workshops and other educational formats and events for teachers, parents, and the general public. In fiscal year 1986 more than 2,200 teachers and more than 4,300 high school students were direct participants in these programs.

In fiscal year 1986 the Kennedy Center Education Program gave the Frances Holleman Breathitt Award for Excellence to Jim Henson in recognition of his contributions to the arts and to young people. The Education Program also created the Jack Morrison Playwriting Fellowship, which provided support for an additional writer to attend the Shenandoah Valley Playwrights Retreat.

Specially Priced Ticket Program

Since it opened in September 1971, the Kennedy Center has maintained a Specially Priced Ticket Program—the largest such program in the nation—through which tickets to Kennedy Center-produced and presented attractions are made available at half price to students, handicapped persons, senior citizens, low-income groups, and military personnel in grades E-1 through E-4. The attendant costs, in terms of reduced revenue potential and administrative overhead, are borne by the Kennedy Center.

During the twelve-month period ending September 30, 1986, combined half-price ticket sales, from Kennedy Center and independent productions, totaled 70,858. The sale of these tickets at full price would have resulted in a total additional gross income of \$1,010,751 to the Kennedy Center and the independent producers.

Funding

Built at a cost of \$77.8 million—\$34 million contributed by the private sector, \$23.4 million appropriated by the federal government as a matching grant, and \$20.4 million loaned by the federal government and now being repaid—the Kennedy Center is unique in its operation as both a performing arts center and a presidential memorial. The National Park Service provides funding through annual appropriations to maintain and secure the building as a presidential memorial; the performing arts operation is charged its prorata share of such costs totaling more than \$1 million annually. Meanwhile, the Kennedy Center's Board of Trustees is wholly responsible for the cost of maintaining and improving the theaters, backstage, and office facilities.

Artistic programming at the Kennedy Center and its day-to-day performing arts operations have been almost entirely privately supported. The Kennedy Center also raises private funds for its wide range of free or modestly priced education and public service activities. Since the Kennedy Center's opening in 1971, foundations, corporations, and individuals have contributed more than \$43 million for these purposes. The nation's business community has played an important part in this effort through the Corporate Fund established in 1977 by a group of national corporate leaders. Under the leadership of Corporate Fund Chairman James E. Burke, chairman of Johnson & Johnson, the 1986 Corporate Fund contributed more than \$2.3 million from nearly 300 corporations.

In recent years, less than 3 percent of the annual operating budget of the Kennedy Center has come from federal sources, and most of these funds have been received from the U.S. Department of Education for the center's education programs.

In 1985 the Kennedy Center launched a campaign to build a permanent endowment for the center to help achieve the financial stability needed to sustain and increase the quality and variety of programming. By September 1986 the center had raised more than \$7 million toward its \$27 million goal. Included in this total is a

\$1 million challenge grant for endowment from the National Endowment for the Arts; the center achieved the three-to-one match with private contributions before the year's end.

Kennedy Center Honors

The Kennedy Center Honors were first awarded by the board of trustees in 1978 to recognize the lifetime contributions to the cultural life of our nation by its finest performing artists. An annual event, the Honors Gala is the Kennedy Center's most important fund-raising benefit; the 1985 Honors Gala evening raised more than \$1 million in net proceeds to support programming. The 1985 honorees were Merce Cunningham, Irene Dunne, Bob Hope, Alan Jay Lerner, Frederick Loewe, and Beverly Sills. Preceding the Honors Gala was a reception at the White House, hosted by President and Mrs. Ronald Reagan.

Friends of the Kennedy Center

The Friends of the Kennedy Center is a nationwide organization that provides financial, administrative, volunteer, and community relations assistance. Founded in 1966 to raise grass-roots support among private citizens for the building of a national cultural center, the Friends organization, with more than 30,000 donor members and 700 volunteers, continues to increase its programs and activities.

Revenues from the Friends membership program, gift shops, and fund-raising events help to support a number of national and community projects. For the last two years, the Friends sponsored Inside/Out, an all-day festival of free performances and activities which drew more than 50,000 people. Other public service programs financially supported by the Friends included the Specially Priced Ticket Program, the American College Theater Festival, the national Imagination Celebration performing arts festival for children, and free organ concerts.

The Friends volunteer force staffed the gift shops and information center, provided special assistance to handicapped visitors, administered the SPT program, and conducted free tours of the Kennedy Center for more than 200,000 people. Although the majority of Friends members are drawn from the Washington area, there are members in all fifty states.

National Gallery of Art

J. Carter Brown, Director

The National Gallery of Art, although formally established as a bureau of the Smithsonian Institution, is an autonomous and separately administered organization. It is governed by its own board of trustees, the ex officio members of which are the Chief Justice of the United States, the Secretary of State, the Secretary of the Treasury, and the Secretary of the Smithsonian Institution. Of the five general trustees, Franklin D. Murphy continued to serve as chairman of the board, with John R. Stevenson and Carlisle H. Humelsine as the gallery's president and vice-president, respectively. Also continuing on the board were Ruth Carter Stevenson and Robert H. Smith.

During the year, the number of visitors increased by 80 percent over the previous year, for a total of 9,162,072. This extraordinary jump in attendance can be attributed largely to four very popular exhibitions:

1) *The Treasure Houses of Britain: Five Hundred Years of Private Patronage and Art Collecting*; 2) *The New Painting: Impressionism 1874–1886*; 3) *Winslow Homer Watercolors*; and 4) *Impressionist to Early Modern Paintings from the U.S.S.R.: Works from the Hermitage Museum, Leningrad, and the Pushkin Museum of Fine Arts, Moscow*.

The *Treasure Houses* exhibition, the largest single temporary exhibition ever held at the gallery, occupied most of the East Building public space. Seventeen rooms were constructed and decorated to evoke the ambiance of the British country house over five centuries, from the fifteenth-century Tudor Renaissance onwards. Most of the 717 objects had never been on view outside the more than 200 houses from which they were borrowed. Included in the exhibition were old master paintings, sculpture and drawings, furniture, porcelain, tapestry, jewelry, armor, silver, and other decorative arts. The Prince and Princess of Wales were patrons of the exhibition and visited it soon after it opened to the public, as did the President and Mrs. Reagan.

The New Painting: Impressionism 1874–1886, which commemorated the centennial of the last of the eight group exhibitions which were organized by the impressionist painters, presented a scholarly reconstruction of a cross section of the eight shows and included approximately 150 paintings by key figures of the group, as well as outstanding examples by their less well-known contemporaries.

The exhibition of ninety-nine watercolors by Winslow Homer celebrated the 150th anniversary of the artist's birth. Selected from sixty public and private American collections, the works demonstrate Homer's skill and versatility in the use of the watercolor technique.

The exhibition of forty-one *Impressionist to Early Modern Paintings from the U.S.S.R.*, the first major art exchange to result from the cultural agreement signed at the summit meeting in Geneva in November 1985, included spectacular works which had been acquired by two innovative Russian collectors, Ivan Morozov and Sergei Shchukin, before World War I and had never been exhibited in the United States. In exchange, the gallery sent forty nineteenth-century French paintings to Russia to be shown at the Hermitage in Leningrad and at the Pushkin Museum in Moscow.

Other exhibitions during the year included the "museum set" of photographs by American photographer Ansel Adams who died in 1984. The artist's widow, Virginia Adams, generously presented the gallery with her personal museum set.

The first national retrospective exhibition of the highly influential nineteenth-century American landscape painter George Inness highlighted the artist's development over forty years. A selection of thirty-three baroque paintings from the John and Mable Ringling Museum of Art celebrated the museum's fortieth anniversary of ownership by the state of Florida.

In honor of the generosity of Mr. and Mrs. Paul Mellon, an exhibition of almost 100 of the many works by American, British, and French artists given over the years by Mr. and Mrs. Mellon included a number which were part of their most recent gift in December and had rarely, if ever, been seen at the gallery.

An exhibition of master drawings from the fifteenth to the nineteenth centuries was lent by the Nationalmuseum in Stockholm. One of the most important works in the collection, a very rare fifteenth-century drawing by Ghirlandaio, was included in the exhibition. An exhibition organized by the gallery and the Museum Boymans-van Beuningen in Rotterdam brought to the gallery 100 drawings by the seventeenth-century Dutch artist, Jacques de Gheyn. A selection of seventy-five small bronze sculptures from one of the world's greatest collections of Italian and northern European bronzes of the fifteenth to the mid-seventeenth centuries was lent by the Kunsthistorisches Museum, Vienna.

Finally, the gallery was privileged to borrow a late masterpiece by Titian, *The Flaying of Marsyas*, from the State Museum of Kromeriz in Czechoslovakia. Its exhibition marked its first in America and only the second time in three centuries that the painting had ever left Czechoslovakia.

The permanent collections were enriched by a number of significant purchases, most important of which was



Rembrandt Peale's *Rubens Peale with a Geranium*, one of the great icons of American painting. It was especially appropriate that it be the first purchase using income from the gallery's new art purchase endowment fund, the Patrons' Permanent Fund. The acquisition of a pair of late works by the Bolognese painter, Guercino, *Joseph and Potiphar's Wife* and *Annon and Tamar*, provided needed reinforcement of the gallery's collection of Baroque painting. Other purchases included a 1946 painting by Jean Dubuffet entitled *La Dame au Pompon*; an early seventeenth-century Dutch landscape by Pieter Molijn, the gallery's first early realist landscape in the Dutch collection; a fine reduced version in bronze of seventeenth-century French sculptor Pierre Puget's *Milo of Crotona*; and two nineteenth-century sculptures, a marble relief, *La Pensee*, by the French sculptor Henri-Michel-Antoine Chapu, and a bronze figure group by Marius-Jean-Antoin Mercie.

Purchases of drawings included a number of fine eighteenth-century works. A large presentation drawing by Piranesi is perhaps the most important drawing from the height of his career in the 1760s and is the only drawing known which the artist fully signed and dated. Also among this group is a sheet of elegantly dressed figures by Guardi.

Purchases of prints were highlighted by two unique and rare works. Mantegna's *Entombment* is the first great print of Italian art. Also acquired was a unique complete first-edition set of Piranesi's *Grotteschi*.

Outstanding among the gifts received by the gallery during the year was a group of paintings, sculptures, and graphics given by Mr. and Mrs. Paul Mellon. Included were twenty-seven nineteenth-century French paintings among which were the gallery's first Caillebotte, a Morisot, a Bazille portrait, a Cezanne figure of a harlequin, a Degas, and a delicate Sisley seascape. Twentieth-century paintings included a Derain *View of the Thames*, two works by Matisse, a Feininger, a Vallotton, the gallery's first Magritte, and a 1912 cubist collage, *The Cup of Coffee*, by Picasso. Five American paintings were included: two by Homer, two by Eakins, and one by Prendergast. A remarkable group of small sculpture studies by Degas—seventeen wax studies of dancers and other figures, five bronze statuettes, and a plaster figure of a

young dressed ballet dancer—was also given by Mr. and Mrs. Mellon. Among the graphics in the gift are watercolors, drawings, and pastels by Cezanne, Degas, van Gogh, Manet, Matisse, Picasso, Pissarro, and Vuillard, and prints by Degas, Toulouse-Lautrec, and Vuillon.

Among the other gifts this year were a drawing by Sebastiano del Piombo, *Prophet Addressed by an Angel*, and a sculptured portrait of the Baron Cromot Dubourg by J. B. Lemoine II. The gallery also received the last triptych by Max Beckmann in private hands, *The Argonauts* (1950), and two other works, *Falling Man* and *Christ in Limbo*. Other twentieth-century works acquired were a large acrylic by Sam Francis entitled *White Line* and a colorful bronze sculpture by Nancy Graves entitled *Spinner*.

A gift of 221 prints by contemporary artists published at Gemini G.E.L. in Los Angeles from the mid-1960s through the late 1970s doubled the size of the gallery's growing Gemini Archive and included strong groups of works by Rauschenberg, Stella, and Kelly. A second major archive of contemporary prints was established with a gift of all the works published to date by Graphicstudio in Tampa, by such contemporary artists as Rauschenberg, Rosenquist, Dine, Pearlstein, Richard Smith, and Close. One of the icons of twentieth-century printmaking, Ernst Kirchner's *Five Tarts*, was also given.

Extension Program audience reports indicate that in fiscal year 1986, 170,513,085 persons viewed Extension programs—exceeding by more than 35 percent the previous year's record-breaking audience level. This figure reflects the department's promotion of program material to a large number of educational and cultural organizations and to public television facilities—either directly or through the Affiliate Loan System. During the year, this system added almost 100 agencies which serve as subsidiary distributors of the programs. Another reason for the increase was the doubled use of videocassette titles the department began to offer last year.

The film *John James Audubon: The Birds of America*, produced by the department in 1985, won a CINE Golden Eagle Award and was selected for worldwide satellite transmission via the U.S. Intelligence Agency's WORLDNET telecommunications system.

As part of the Education Department's program to enrich the young visitor's enjoyment and understanding of the temporary exhibitions, British educator and artist James Heard appeared during the Impressionism exhibition as the artist Edgar Degas, inviting both school classes and families to his "studio" in the West Building auditorium to help him paint a picture of Miss Lala, the

James Heard as Edgar Degas is shown during his performance "Meet the Artist" held twice weekly during March and April 1986 at the National Gallery of Art.

famous star of the Cirque Fernando, the subject of the original picture hanging in the exhibition.

Among the guest scholars who lectured during the year, John Szarkowski, director of the department of photography at the Museum of Modern Art, gave the keynote lecture for the *Ansel Adams* exhibition; Per Bjurström, director of the Nationalmuseum, Stockholm, spoke during the exhibition of drawings from that museum; and Helen Cooper, curator of American art at the Yale University Art Gallery, lectured on Winslow Homer's watercolors. Some of the lecturers during the *Treasure Houses* exhibition were the guest curator of the exhibition, Gervase Jackson-Stops; Sir Francis Watson, decorative arts historian; Martin Drury, Historic Buildings secretary for The National Trust, London, who spoke on "The Survival of the British Country House;" John Harris, director of the Royal Institute of British Architects who gave a lecture entitled "And They All Came Tumbling Down: The Demolition of the Great Country Houses in Britain, 1870-1970;" and Lord John Julius Norwich who spoke on "The Palladian Country House in England." The A. W. Mellon Lectures in the Fine Arts were given by composer Lukas Foss who gave six talks with piano accompaniment entitled "Confessions of a Twentieth-Century Composer." Among the other speakers during the year were architectural historian Mark Girouard; George Heard Hamilton, director emeritus, Sterling and Francine Clark Art Institute, Williamstown, Massachusetts; and Terisio Pignatti, professor of art history at the University of Venice.

The Archives Department, which was established in 1984 in anticipation of the gallery's fiftieth anniversary in 1991, received from I. M. Pei and Partners, the architects of the East Building, the records of the building's design and construction, including drawings, photographs, slides, and studies, providing rich documentation of the development of the building. The stone construction consultant on the project also donated two cubic feet of records relating to the stonework at the East Building job site.

Temporary Exhibitions

Master Drawings from Titian to Picasso: The Curtis O. Baer Collection

continued from the previous fiscal year to 6 October 1985 coordinated by The High Museum of Art, Atlanta, and Andrew Robison

Figure Drawings from the Collection

continued from the previous fiscal year to 19 October 1986

German Expressionist Prints from the Ruth and Jacob Kainen Collection

continued from the previous fiscal year to 9 February 1986 coordinated by Andrew Robison

Figure Prints from the Collection

continued from the previous fiscal year to 19 February 1986

Ansel Adams: Classic Images

6 October 1985 to 26 January 1986 coordinated by James Alinder and Nicolai Cikovsky, Jr., and supported by the Pacific Telesis Group

Dürer to Delacroix: Great Master Drawings From Stockholm

27 October 1985 to 5 January 1986 coordinated by Per Bjurström, Nationalmuseum, Stockholm, and Andrew Robison and supported by Volvo North America Corporation and the Federal Council on the Arts and Humanities

The Treasure Houses of Britain: 500 Years of Private Patronage and Art Collecting

3 November 1985 to 13 April 1986 coordinated by Gervase Jackson-Stops, the British Council, and D. Dodge Thompson and supported by the Ford Motor Company, indemnities from Her Majesty's Treasury and the Federal Council on the Arts and Humanities, and British Airways

The New Painting: Impressionism 1874-1886

17 January to 6 April 1986 coordinated by Charles S. Moffett, The Fine Arts Museums of San Francisco, and Charles F. Stuckey and supported by AT&T and the Federal Council on the Arts and Humanities

Titian: The Flaying of Marsyas

17 January to 20 April 1986 coordinated by Sydney J. Freedberg and supported by the Federal Council on the Arts and Humanities

Winslow Homer Watercolors

2 March to 11 May 1986 coordinated by Helen A. Cooper, Yale University Art Gallery, and Nicolai Cikovsky, Jr., and supported by the IBM Corporation

Drawings by Jacques de Gheyn

9 March to 11 May 1986 coordinated by A.W.F.M. Meij

Reading Is Fundamental, Inc.

Mrs. Elliot Richardson, Chairman
Ruth Graves, President

and J.A. Poot, Museum Boymans-van Beuningen, and Andrew Robison, and supported by the Federal Council on the Arts and Humanities

Baroque Masterpieces from the John and Mable Ringling Museum of Art

6 April to 29 September 1986 coordinated by Anthony Janson, The John and Mable Ringling Museum of Art, and Beverly Louise Brown

Impressionist to Early Modern Paintings from the U.S.S.R.: Works from the Hermitage Museum, Leningrad and the Pushkin Museum of Fine Arts, Moscow

1 May to 15 June 1986 coordinated by D. Dodge Thompson and supported by Occidental Petroleum Corporation, the Armand Hammer Foundation, and the Federal Council on the Arts and Humanities

George Inness

22 June to 7 September 1986 coordinated by Michael Quick, Los Angeles County Museum of Art, and Nicolai Cikovsky, Jr.

Gifts to the Nation: Selected Acquisitions from the Collections of Mr. and Mrs. Paul Mellon

20 July to 7 September 1986 coordinated by Charles F. Stuckey

Renaissance Master Bronzes from the Kunsthistorisches Museum, Vienna

17 August to 30 November 1986 coordinated by Manfred Leithe-Jasper, Kunsthistorisches Museum; Donald McClelland, the Smithsonian Institution Traveling Exhibition Service; and Douglas Lewis; and supported by Republic National Bank of New York and Banco Safra, S.A., Brazil

Reading Is Fundamental, Inc. (RIF) was formed in 1966 to ensure that America's children grow up reading. Today, thanks to the efforts of some 100,000 volunteers, the program reaches more than 2.1 million children in all fifty states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. RIF goes wherever children are—schools, libraries, housing projects, Indian reservations, migrant worker camps, hospitals, centers for the handicapped, and juvenile detention centers. Operating through a grass-roots network of some 3,150 projects and more than 10,000 sites, the program has brought more than 75,000,000 books into America's homes over the last twenty years.

Educators say that it is the child's attitude that turns the child into a lifelong reader. The late Mrs. Robert McNamara, RIF's founder, intuitively recognized this; to get youngsters interested in reading, she made books available to them free of charge and then gave them the chance to choose and keep the books they liked best.

This approach, combined with creative activities designed to arouse children's interest in reading, has proved remarkably successful. From around the country RIF volunteers report the following results with striking consistency: positive changes in children's reading habits; children checking out more books from school and public libraries; widespread parent involvement in children's education and increased community support for reading; and increased reading achievement.

Recent studies affirm the soundness of RIF's approach. *Becoming a Nation of Readers*, a National Institute of Education report on reading, and *What Works*, a U.S. Department of Education report on effective approaches to teaching and learning, both verify methods that are central to RIF's approach. Further support comes from *Investing in Our Children* (produced by the Committee for Economic Development), *The Reading Report Card* (produced by the National Assessment of Educational Progress), and *Books in Our Future* (from the Librarian of Congress).

Support from both the public and private sectors has made it possible for RIF to grow from a small pilot program into the nation's largest reading motivation program. Since the Ford Foundation gave RIF its start twenty years ago, America's private sector has been generous to RIF. Today more than 6,000 businesses and organizations support RIF locally, and some 350 booksellers and publishers offer RIF projects substantial discounts on books and special services. Over the last fifteen years, the broadcast and print media have given

more than \$45 million in free air time and space to RIF's campaign to promote reading.

In 1976 Congress created the Inexpensive Book Distribution Program, modeling it on RIF. Reading Is Fundamental continues to operate this program under a grant from the Department of Education. The program allows RIF to match local funds for the purchase of books.

Highlights of 1986

Nineteen eighty-six was a yearlong celebration of RIF's twenty years as a literacy program. To mark the beginning of this anniversary, the Manhattan Reading Council of the International Reading Association presented RIF President Ruth Graves with the council's Literacy Award in recognition of RIF's success in motivating children to read.

Warner Brothers invited RIF to be the beneficiary of the world premiere on December 16, 1985, of *The Color Purple*, the film based on the Pulitzer prize-winning novel by Alice Walker. During the reception at Cinema I, RIF board chairman Mrs. Elliot Richardson greeted more than 700 guests, including producer-director Steven Spielberg and the film's stars. Arthur Ashe, a member of RIF's Advisory Council, was chairman of the benefit; and Mrs. George Bush, a member of the RIF board of directors, served as honorary chairman. Cochairmen were Mrs. Bryant Gumbel and Mrs. Ruth Sulzberger Holmberg, a RIF board member.

A grant from Hallmark Cards, Inc., enabled RIF to conduct a twentieth anniversary poster contest in which 350,000 young people participated. Seven-year-old Cindy Bergman of Stamford, Connecticut, won the contest with a picture of her mother reading in the bathtub. "She's comfortable there," said Cindy. Winning posters from each state were exhibited alongside Cindy's at the American Booksellers Association convention in New Orleans, at the Miami Youth Museum, and in Washington, D.C.

Once again, young people from across the country took part in the popular RIF program *In Celebration of Reading*, a campaign to promote reading in the home sponsored for the second consecutive year by the National Home Library Foundation. The names of local RIF readers were entered in a national drawing on April 2 at the Smithsonian; Mrs. Bush drew the name of Christopher Andrews, 6, of Council Bluffs, Iowa, as the 1986 RIF Reader of the Year.

Both Chris and Cindy, their families, and the coordinators of their RIF projects were brought to Washington, D.C., to participate in Reading Is Fun Week activities. The two youngsters also appeared on NBC's *Today* show with Mrs. Bush.

To mark RIF's twentieth anniversary, the Young Readers Division of the Putnam Publishing Group published the book *Once Upon a Time: Celebrating the Magic of Children's Books in Honor of the Twentieth Anniversary of Reading Is Fundamental*. All profits from its sale have been donated to RIF by Putnam, and thirty-two of the nation's most distinguished writers and artists in the field of children's literature donated stories, poems, and artwork.

Clowns, circus dancers, unicyclists, an elephant named Targa, and a bear called Peggy were all on hand to welcome some 300 young people from RIF projects in the New York area on April 18 at the Lincoln Center Library for the Performing Arts in New York City. The occasion was the launching of a unique program called "Ringling Readers," a collaboration between RIF and Ringling Bros. and Barnum & Bailey Circus to promote reading. This program was also presented to RIF youngsters attending RIF's twentieth anniversary celebration on the Mall and to RIF projects in more than eighty cities along the circus route.

To commemorate Reading Is Fun Week (April 20-26), Congress passed a joint resolution, introduced by Senator Mark Hatfield (R-Oregon) and Representative Silvio Conte (R-Massachusetts), affirming that "National Reading Is Fun Week has been and will continue to be a nationwide literacy effort encouraging millions of young people to read." Thirty-three senators and 226 representatives cosponsored the resolution.

Across the nation, RIF projects celebrated Reading Is Fun Week with read-ins, young authors' days, storytelling jamborees, book fairs, and hundreds of other reading-related events. To honor RIF's founder, local projects presented individuals or groups who had made outstanding contributions to the literacy cause with Margaret McNamara Certificates of Merit.

A celebration of Reading Is Fun Week on the Mall rounded off these nationwide activities. Under a yellow tent, a joyous mix of clowns, mimes, bluegrass musicians, and Washington, D.C., area young people gathered for a ceremony honoring the winner of RIF's poster competition and the National RIF Reader. Education Secretary William J. Bennett and Mrs. George Bush were

Woodrow Wilson International Center for Scholars

James H. Billington, Director

among the speakers at the ceremony. Afterwards, youngsters were treated to a "Reading Is Three Rings of Fun" program by Ringling Bros. and Barnum & Bailey clowns and to dramatizations of storybooks by the Library Theatre Group. Then children lined up to choose RIF books and, despite a heavy downpour, ran out into the National Mall to launch balloons with messages attached.

During the American Booksellers Association (ABA) annual May convention, held last year in New Orleans, Reading Is Fundamental was honored with the prestigious Irita van Doren Award, which recognized "RIF's contributions to the cause of the book as an instrument of culture in American life." The trade show was also the occasion for an announcement of the Give the Gift of Literacy campaign. RIF was designated by campaign sponsors (the ABA and the National Association of College Stores, among others) as one of two beneficiaries of money raised during the first year of this three-year fund-raising drive for literacy programs.

A highlight of the convention was a parade staged by RIF and underwritten by B. Dalton Bookseller. A Creole band led a parade of floats designed to resemble giant storybooks that transported hundreds of books, all donated by ABA booksellers, to the children of Kingsley Community Center, site of a RIF project.

Mrs. Graves also conducted a training workshop for conventioners, called "Literacy Promotion at the Local Level," in which she detailed ways local bookstores and institutions can encourage children to read.

Sports and reading went hand in hand when Waldenbooks, for the second year in a row, sponsored the Charity Golf and Tennis Tournament for the benefit of RIF. More than a hundred members of the book community participated in the tournament, which was held in September at the Sleepy Hollow Country Club in Scarborough-on-Hudson, New York.

Thousands of parents are learning how to motivate their children to read through the RIF program. This year, through generous grants from the private sector, RIF was able to present twelve "Growing Up Reading" parent workshops (sponsored by the General Electric Foundation and Beatrice Companies, Inc.) and to publish four brochures with practical tips on how to encourage reading in the home produced through grants from Snuggle Fabric Softener (a Lever Brothers product) and Beatrice Companies.

The Wilson Center is one of three institutions—with the Kennedy Center for the Performing Arts and the National Gallery of Art—that operates with mixed trust/public funding created by the Congress within the Smithsonian Institution, fulfilling a national mission under a board appointed by the President of the United States. The Wilson Center is an active workshop and switchboard for scholarship at the highest levels. Since its opening sixteen years ago, it has gained widespread recognition for the work of its fellows in mining the scholarly riches of Washington, for its many meetings that bring together the world of affairs and the world of ideas, and for its democratic openness to all comers through its annual fellowship competition.

Each year, some fifty fellows are brought in through open international competition involving ever-increasing numbers of applicants from a wide range of backgrounds, disciplines, cultures, and nations. A broad spectrum of ideas is, in turn, shared with a nonspecialized national audience through *The Wilson Quarterly*, which has more subscribers than any other scholarly quarterly journal in the English-speaking world.

The Wilson Center seeks to render a service to the world and to the Washington, D.C., community by throwing open its core fellowship program to all interested individuals. Fellows are selected for the promise, importance, and appropriateness of their projects on the recommendation of broadly based academic panels outside the center. The fellows come for limited periods of study in the broadly inclusive program on History, Culture, and Society, as well as in special programs for research on the Soviet Union (the Kennan Institute for Advanced Russian Studies), Latin America, international security, Asia, American society and politics, Eastern Europe, and Western Europe. Each program is directed by a scholar on the staff.

In keeping with its mandate to symbolize and strengthen the fruitful relations between the worlds of learning and public affairs, the center sponsors conferences and seminars on topics of special current interest to both worlds. In 1986 it brought together scholars from diverse disciplines, members of Congress, representatives of the executive branch, businessmen, journalists, military experts, writers, politicians, educators, and diplomats to consider a variety of issues, examine current questions, celebrate major events, and participate in evaluative discussions.

Increasingly, people from different regions of the

United States meet and interact with foreign scholars and members of Washington's growing intellectual community.

Throughout the year, the Wilson Center held more than 200 meetings, including major conferences on vital topics of both national and international interest. In September, a two-day conference was held on "The History of Soviet-American Relations" with such distinguished participants as Arthur M. Schlesinger, Jr., Center for Strategic and International Studies at Georgetown University; Robert C. Tucker, political science professor at Princeton; Robert R. Bowie, Harvard professor of international relations; Walter Stoessel, former ambassador of the United States to the U.S.S.R.; William Hyland, editor, *Foreign Affairs*; Seweryn Bialer, director, Research Institute on International Change, Columbia University; and leading scholars from the Soviet Academy of Sciences.

Another conference/workshop in May on "Environmental Problems and Policies in Eastern Europe" brought such experts as Gardner Brown, chairman, Department of Economics, University of Washington; Lynton Caldwell, Department of Political Science, Indiana University; Gyorgy Enyedi, Hungarian Academy of Sciences; Eugenio Lari, director of Country Programs Department, the World Bank; David McNelis, director, Environmental Research Center, University of Nevada; Helmut Schreiber, International Institute for Environmental and Society Studies, Berlin; Glen Schweitzer, National Research Council; Boris Frlec, vice president of Slovenia, professor of chemistry, University of Ljubljana; and former Wilson Center fellows John W. Futrell, president, Environmental Law Institute; and Philip Lowe, Bartlett School of Architecture and Planning, London.

Contemporary Burma studies were examined in their "International Perspective" at a unique conference on the subject held by the Wilson Center's Asia Program at the Wye Plantation in Maryland. Representatives of the field who joined in the conference were Anna J. Allot, University of London's School of Oriental and African Studies; Michael Aung-Thwin, Center for Southeast Asian Studies, Kyoto University; Denise Bernot, Antony, France; Annemarie Esche, German Democratic Republic; Thomas Gibson, senior economist at the World Bank; Pico Tyer, *Time* magazine; Ryuji Okudaira, Tokyo University of Foreign Studies; Joseph Silverstein, professor of political science, Rutgers University; and Than Tun, Tokyo University of Foreign Studies.

A major conference held in September 1986 on "The Overall History of Soviet-American Relations" covered



A few days before the July 1986 celebration of the Statue of Liberty, the Wilson Center brought together both French and American scholars in a discussion of the 200-year evolution of the concept of liberty. Among those participating in the conference were (left to right): Wilson Center Director James H. Billington; François Bourricaud, professor of sociology, Université de Paris IV; and Donald R. Kelly, professor of history, University of Rochester.

the period since 1933 in sessions entitled: "The Background to Wartime Cooperation 1933-41," "The Extent and Limits of Wartime Cooperation 1941-45," "Postwar Difficulties 1945-55," "New Approaches 1955-65," "The Rise of Detente 1965-75," "New Problems and Possibilities 1957-86," and "Overall Lessons for the Future." These sessions included such speakers as Raymond Garthoff, Brookings Institution senior fellow; Adam Ulam, director of the Harvard Russian Research Center; Viktor L. Malkov, Institute of World History, U.S.S.R. Academy of Sciences; Vladimir O. Pechatnov, U.S.S.R. Academy of Sciences; Vladimir A. Stepanov, Department of Foreign Relations, presidium; Richard Clark, Aspen Institute director; Edward Rowny, special representative for negotiations, Arms Control and Disarmament Agency; Sonya Sluzar, *Problems of Communism*; Tom Foley, U.S. representative from Washington; Thomas Downey, George Miller, Sid Morrison, and former Wilson Center fellow Thomas Petri, U.S. representatives from New York, California, Washington, and Wisconsin, respectively.

Of special interest were two evening discussions on broad contemporary religious topics. In December 1985, George S. Wiegel, former Center fellow and president of the James Madison Foundation, and John Cardinal O'Connor, Catholic Archbishop of New York, presented

"War, Peace and the Catholic Moral Imagination: The American Moment." Among the participants in the discussion, which was moderated by Wilson Center Director James H. Billington, were John Agresto, acting chairman of the National Endowment for the Humanities; Robert H. Bork, U.S. circuit judge, U.S. Court of Appeals, D.C. Circuit; William Byron, S.J., president, Catholic University of America; Edward Doherty, U.S. Catholic Conference; Alan Geyer, the Churches Center for Theology and Public Policy; J. Bryan Hehir, U.S. Catholic Conference; Menahem Milson, Wilson Center fellow and professor of Arabic literature, Hebrew University of Jerusalem; Daniel P. Moynihan, U.S. Senator from New York; John Noonan, former Wilson Center fellow and professor of law, University of California, Berkeley; Michael Novak, American Enterprise Institute; Robert Pickus, president, World Without War Council; Eugene Rostow, National Defense University; Paul Sigmund, Wilson Center fellow and professor of politics at Princeton University; and Ashley Tellis, Woodstock Theological Center.

On another occasion in March 1986, a discussion took place on "Religion and Modern American Intellectual History." Speakers were Henry May, Margaret Byrne professor of history, University of California, Berkeley; and David Tracy, professor of theology at the University of Chicago Divinity School. Participants included Bill Bradley, U.S. Senator from New Jersey; James Childress, former fellow and Kyle Professor of Religious Studies at the University of Virginia; James L. Connor, rector of Holy Trinity Church, Washington D.C.; Ronald P. Dore, Technical Change Center, London and Center fellow; Thomas M. Gannon, S.J., director of the Woodstock Theological Center, Georgetown University; John Higham, professor of history at Johns Hopkins University and former fellow; William R. Hutchinson; Charles Warren, professor of the history of religion in America at Harvard University; Mark Juergensmeyer, associate professor of ethics and the phenomenology of religions, University of California, Berkeley; Nancy Kassebaum, U.S. Senator from Kansas; Nicholas Lash, fellow at the Wilson Center and Norris-Hulse professor of divinity, University of Cambridge, U.K.; Thomas Petri, U.S. Congressman from Wisconsin; Stephen Rosenfeld, *The Washington Post*; Ehud Sprinzak, Wilson Center fellow and senior lecturer in political science, Hebrew University of Jerusalem; and Ken Woodward, religion editor of *Newsweek*.

Many other meetings on a wide variety of subjects included "The Psychological Dimension of Political Leader-

ship," a discussion by Nigel Forman, member of Parliament, U.K. An evening dialogue was held in June on "American Indians: Ancient Values in a Modern Context" in which Scott Momaday, University of Arizona; Clara Sue Kidwell, University of California, Berkeley; Ben Whitehorse Campbell, member of the Colorado State Senate; and A. David Lester, executive director of the Council of Energy Resource Tribes participated. A dinner-discussion on "Government and Social Science" had two keynote speakers: Daniel P. Moynihan, U.S. Senator from New York, and Edward Shils, professor of sociology and social thought at the University of Chicago. An afternoon colloquium on "The Quest for Historical Identity in Turkey" featured Bozkurt Güvenc, professor of anthropology at Hacettepe University, Ankara. "The Civil Rights Revolution" was discussed by Kenneth B. Clark, president of Clark, Phipps, Clark & Harris, Inc. and Wilson Center Board of Trustees member. Waldo Huntley Heinrichs, professor of history at Temple University and Center fellow, spoke on "Roosevelt and the American Entry into World War II," with Arthur M. Schlesinger, Jr., professor of humanities at City University of New York commenting. A seminar on "Gorbachev's Revolutionary Changes" was led by Ernst Kux, foreign editor of *Neue Zürcher Zeitung* and guest scholar at the Wilson Center. Bertrand Goldshmidt, former head of the Chemistry and International Relations Division of the French Atomic Energy Commission, spoke on "The Origins of the French Nuclear Weapons Programs."

The Wilson Center's fellows continued to come from countries all over the world, from many disciplines, and from many areas of the United States. Among its 1986 fellows were Nicholas Lash, Norris-Hulse professor of divinity, University of Cambridge, U.K.; Kwasi Wiredu, former professor of philosophy at the University of Ghana; Judith A. Thornton, professor of economics, University of Washington, Seattle; Clyde Prestowitz, counselor to the U.S. Secretary of Commerce; Koentjaraningrat, professor of anthropology, University of Indonesia, Jakarta; and Svetozar Stojanovic, professor of social science, University of Belgrade, Yugoslavia.

The collegial atmosphere at the Wilson Center provides an opportunity for learning and the exchanging of ideas—permitting this broad and heterogeneous mix of fellows to engage in an intellectual life much greater than the sum of its parts. The Wilson Center transcends all national and academic boundaries in serving its chartered purpose to bring together ideas and experience on a global scale.

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Cover: Morning sun highlights the rich colors and the picturesque towers, turrets, and spires of the Arts and Industries Building, and the Castle beyond. This lofty view facing the west was photographed by Charles H. Phillips.

Frontispiece: This statue of Joseph Henry, first Secretary of the Smithsonian, faces the National Mall.

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Smithsonian Year 1987

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1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

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Smithsonian Year 1987

Annual Report of the Smithsonian Institution for the Year Ended September 30, 1987



Ganesha, a temple sculpture from Halebid (Mysore) in South India, thirteenth century. Arthur M. Sackler Collection. (Photograph by Kim Nielson)

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SMITHSONIAN INSTITUTION

The Smithsonian Institution was created by act of Congress in 1846 in accordance with the terms of the will of James Smithson of England, who in 1826 bequeathed his property to the United States of America "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." After receiving the property and accepting the trust, Congress incorporated the Institution in an "establishment," whose statutory members are the President, the Vice President, the Chief Justice, and the heads of the executive departments, and vested responsibility for administering the trust in the Smithsonian Board of Regents.

The Establishment September 30, 1987

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Samuel R. Pierce, Jr., Secretary of Housing and Urban
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Elizabeth H. Dole, Secretary of Transportation
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September 30, 1987

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and Development

Statement by the Secretary

Robert McC. Adams

On September 28, virtually at the end of the fiscal year on which this Annual Report is focused, the doors of the great Quadrangle complex immediately to the south of the Smithsonian Institution's "Castle" headquarters were finally opened to the public. This long-awaited event, anticipated by several weeks of scholarly symposia and similar celebratory occasions, culminated an intricate process of planning, financing, and construction that had its origin more than a decade earlier. The Smithsonian, and indeed the nation, has gained two splendid new museums, together with several related facilities, a beautiful garden, and other public attractions that will permanently grace the Mall in Washington. And the Institution's unrivaled capacity to inform and represent the world has taken another giant step forward.

Success in this unique and visionary enterprise came only as a result of a host of contributions taking many

different forms. To begin with, its construction represented an unprecedented partnership of public and private funding efforts. We accordingly have many friends in the Congress to thank on the one hand, and on the other some 38,000 individual, corporate, and national contributors who together made it possible to match the federal appropriation toward the cost of construction. Acknowledgment of their vital role is inscribed at the three entrances to the complex, and fully recorded within it for public reference.

With so many to thank, I must concentrate in these pages on only the handful whose contributions most centrally defined and gave life to the enterprise. First among them, although to our deep regret he did not live to see its completion, was Dr. Arthur M. Sackler. The founding core of the marvelous collection housed in the new gallery carrying his name was drawn at his invitation from



The ribbon cutting at the dedication ceremony of the Arthur M. Sackler Gallery and the National Museum of African Art. Cutting the ribbon are (from left to right) Jean Paul Carlhian, architect; the Reverend John Kinard, director of the Anacostia Museum; Secretary Emeritus S. Dillon Ripley; Secretary Robert McC. Adams; and Anne Armstrong, former ambassador to Great Britain and a Smithsonian regent. (Photograph by Dane Penland)

his own unsurpassed collection of Far and Near Eastern antiquities. There can have been few patrons of the arts, in our time or any other, with either his sensitivity to the interplay of ancient art and technique or his concern for the larger significance of national collections. Both are reflected in what he has given us. Dr. Sackler's own scientific career and wide-ranging interests in the arts and public communication intersected with those of the Smithsonian at many points, and his vision of the world unity of human intellectual and cultural efforts is one from which we will continue to draw inspiration.

Mrs. Enid Haupt is a second dominating spirit. A great authority on gardens in her own right, she generously provided the means to surmount the Quadrangle at ground level with a rare jewel of a garden that frames the complex beneath in living warmth and color. The specific designs that were adopted, as well as the selection of the trees and shrubs, all reflect the rigorous application of her own impeccable standards. Opening four months prior to the Quadrangle itself, the garden's shaded walks and cool fountains have already provided a welcome respite for visitors during the first of many simmering Washington summers.

The original vision of the project, as well as the charisma and determination that carried it forward to ultimate success, were of course those of my predecessor as Secretary, S. Dillon Ripley. The testimony of many colleagues makes clear that he harbored the idea of it for many years before any practical steps toward its implementation became possible. The possibility of adding a newly expanded National Museum of African Art to such a complex probably came to him almost as soon as the museum and its former Capitol Hill headquarters in an ill-adapted series of row houses became a part of the Smithsonian in 1979. To him also belongs the credit for inspiring first Arthur Sackler and then key committees in the Congress with that vision, for shepherding it through the maze of supervisory bodies that have a claim on approving Mall construction of any kind, and finally for mobilizing the interest and support of the public through the National Board of the Smithsonian Associates. By the time I came aboard in September 1984, plans were essentially complete and excavations already under way. It fell to me only to maintain a happy combination of ingredients in place, and to add, massage, or otherwise process them according to well-established recipes.

By action of the Smithsonian Board of Regents, facilities for the important set of outreach activities that are grouped together on the third and deepest level of the complex along a grand concourse have been named the

S. Dillon Ripley Center. Included are the Smithsonian Institution Traveling Exhibition Service (SITES), the National Associates, the Resident Associates, and the Directorate of International Activities. All took shape or were greatly expanded under Ripley's direction, all will benefit from the seminar and lecture facilities that have been provided there, and together they go a very long way toward enhancing the Smithsonian's international as well as national field of action in a direction that one must believe James Smithson always intended that the Institution should take.

Special thanks must also go to architect Jean Paul Carlhian, who imaginatively and ably met two substantial challenges. The first was to construct on a large scale, and deep underground, a building that could supplement its complex, utilitarian functions with its own powers of attraction for visitors. Secondly, and only slightly less daunting, he needed to draw out of an array of conflicting—sometimes changing—demands a single design that would most nearly harmonize the interests of different groups of occupants. The extraordinary outcome that he fashioned interweaves themes drawn from the contrastive cultural contexts of the Asian and African collections, creating a composite whose parts are distinguishable and yet complementary. Visitors pass through successive, engrossing, meticulously imagined settings that augment the objects on view while drawing them toward new and unexpected angles of vision that still lie ahead. Carlhian had a guiding hand, too, in the Haupt Garden that caps the whole assemblage, a place of beauty and tranquility that conclusively drives home the arguments for having built downward rather than upward in the first place.

Hoping to sketch a vision not so much of what was planned as of what is in prospect, let me turn to the many contributions that the new complex is beginning to make to the Smithsonian's programs. It provides, most importantly, a new window on the Mall for fuller representation of the cultural and artistic heritage of some two-thirds of the world's people. To take the case of the National Museum of African Art, its greatly enlarged exhibition areas, drawing extensively upon loaned materials as well as upon permanent collections, make possible the simultaneous display of diverse themes. The richness and variety of the collections thus assembled have had a widely acknowledged impact upon viewers; together with the greater accessibility of the Mall location, this surely accounts for the fact that in its first three full months of operation five times as many visits were recorded as in its last full year on Capitol Hill (1985).

The Sackler Gallery greatly enlarges our coverage of



Brandon Carr and Amecia Stephens discover one of the Smithsonian's backlit dioramas that were placed in five metro subway stations and the Washington, D.C., Amtrak terminal for two months during the summer. Produced by the Office of Public Affairs, the posters described the multiheritage scope of the Smithsonian collections. (Photograph by Dane Penland)

the arts of Asia. While its collections splendidly supplement and amplify those already in the Freer Gallery, its still greater promise is that it engages us more directly in processes of intercourse and representation extending far beyond inanimate displays. The Sackler collections are not tied by the many restrictive provisions governing those of the Freer, which preclude borrowing or loaning objects for special exhibits. Thus the possibilities for creative programming are greatly enlarged, only beginning with the opportunity to borrow objects from many sources as well as loan them. Entirely new kinds of collaboration become possible with specialists from many

countries—in designing exhibits that can travel, in sensitively exploring differences in the interpretation of cultural materials, in combining object-oriented displays with lectures, scholarly seminars, and cultural performances of all kinds, and in frank experimentation with new ways of showing and seeing.

In addition to the major new museums that I have mentioned, there is a special international exhibition gallery that is directly associated with the offices of the Directorate of International Activities. Again, its presence enhances our flexibility in taking thematic approaches that erase the usual boundaries of museum coverage and

draw simultaneously upon the talents and resources of a number of our own constituent museums as well as others. This is exemplified by the opening exhibition. Entitled "Generations," it takes a wide-ranging, cross-cultural look at how, as families and societies, we welcome infants at birth and nurture and protect them as children.

The challenge of improved representation of other cultural and artistic traditions, in short, is one that looms before us with new force and clarity as a result of the completion of the Quadrangle complex. The challenge itself is not new. It has always been too easy to take for granted that things in our collections can speak for themselves. At least in part, that complacent assumption is what the passion for authenticity commonly attributed to museums and their curators is all about. But truth, or at least the whole truth, is not to be so easily found or exhibited. Museums, as David Lowenthal has written, are distorting mirrors. We may want to think of them as faithful transmitters of the messages of other cultures, or of our own past, but even the most mundane of material artifacts have as many layers of meaning as the events and memorabilia of our own lives. One may try to represent another culture or past way of life in a spirit of objectivity, but the outcome is always, in good measure, a creative act.

Thomas Lawton, Director of the Arthur M. Sackler Gallery, and Jill Sackler, widow of the museum's benefactor, at the press preview on September 10. (Photograph by Kim Nielsen)



"Our" conception of culture traditionally has tended to be a largely materialistic one valuing not an inward journey toward harmony or understanding but an accumulation of inventions and achievements. "Progress" was, until recently, an article of faith. But aside from its undoubted capacity for technological supremacy, doubts are now accumulating that there is any innate superiority in this viewpoint. Should we not concede the possibility that the ideal of disembodied machinery as an effortless cornucopia of endlessly increasing material wealth provides an inadequate basis on which to probe for patterns of significance—at least in the cultures of "others," and perhaps even in our own? Inevitably, given the cultural standpoint from which curators begin and in spite of dedicated efforts to the contrary, museums to some degree will always misunderstand, distort, and fragment the "other" cultures they seek to portray. And inadvertent though they may be, those departures from the unrealizable ideal of objectivity are often regarded as—and in fact *are*—trivializing and demeaning to the cultures it is our aim to represent.

Here, then, is the contemporary challenge of representation. As the Smithsonian further enlarges the scope of its collections and increases—now by two, in a single, auspicious opening—the number of monumental repositories in which it places them, it becomes more incumbent on us to acknowledge that these steps in the direction of universality should be matched by increasing efforts to improve our standards of representation. A number of curators at the Smithsonian currently are engaged in just such efforts. They have held and are planning several projects or colloquia, partly in recognition of an obligation to our own immense, multi-ethnic public but also in hopes of providing leadership in addressing similar concerns not only at other museums in this country but around the world.

This brings me to a closely related responsibility to increase the representation of women and minorities within the Smithsonian's own ranks, and especially on its professional, technical, and administrative staffs. Obligations exist, in any case, to take affirmative action toward this end. Those obligations assume even greater moral force in a city like Washington, where a substantial majority of the population is constituted of blacks and other minorities. But the connecting link with the issue of museum representation is that efforts to do both strongly reinforce—may even be necessary accompaniments of—one another.

Sensitivity to the nuances of portraying cultural differences without trivializing them or erecting false, demean-

ing stereotypes is more likely to grow out of daily, working contact with such differences than out of mere abstractions in an absence of opportunity for broadening experience. Interaction, iterative encounters with alternative sets of cultural perspectives and priorities, the give and take of a continuing dialogue in which the diversity characteristic of a museum's public finds some significant expression in the preparation of exhibits on their behalf—these conditions, while surely not enough in themselves, can make an important contribution. The prospect of that contribution supplies a strong additional incentive to do better and sooner what we should be doing anyway.

Where do we stand at present with regard to the composition of our senior staff? The simple answer is: in need of substantial further improvement in the representation of both women and minorities. Categories are slippery, so that statistical compilations relevant to this involve an element of subjectivity and judgment. Estimates of the available pool of suitably trained and experienced personnel on whom the Smithsonian might hope to draw tend to be even more subjective. Somewhat opportunistically selecting an area for which data are available, however, we might consider the biological sciences as an example of a field in which the Smithsonian is heavily involved. About 10 percent of our permanent professional staff in this group of scientific disciplines currently are women; the total proportion of minorities is somewhat lower, blacks and Hispanics each accounting for only 2 percent.

Figures assembled by the National Science Foundation offer some means of assessing the size of the national pool. Considering individuals engaged in basic research in academic institutions, the proportion of women approximately doubled (to about 15 percent) between 1975 and 1985. If we take a more prospective look by asking about those still in the training pipeline, it appears very likely that this trend will continue. Women who were graduate students in the biological sciences in 1986 amounted to about 44 percent of the total, having risen from 38 percent seven years earlier, while the number of men engaged in advanced study actually dropped. Within the life sciences (a more inclusive category, primarily adding health-related fields) women already outnumbered men by 1980 and by 1985 constituted 56 percent of those enrolled as graduate students.

For minorities, the near-term prospects are much less auspicious. Blacks who were doctoral-level researchers in science or engineering also nearly doubled in numbers between 1975 and 1985, but even in the latter year consti-



Re-creation of a segregated railroad station with sleeping-car porter materials. From the exhibition "Field to Factory: Afro-American Migration, 1915-1940," at the National Museum of American History. (Photograph by Eric Long)

tuted only about 1.2 percent of the total. And while the numbers enrolled as graduate students in the life sciences climbed about 32 percent between 1980 and 1985, they still constituted little more than 3.3 percent of the total.

What lessons are there for us in these figures? For women, the evidence is unambiguous that a decisive shift is occurring fairly rapidly. The proportion of women in the biological sciences who enter our applicant pool—and this observation can be generalized to most other fields—can be expected to increase steadily. There will be an

unavoidable lag dependent on the rate of personnel replacement, and with age differentials full attainment of equality of status and opportunity may lag even longer. But the Smithsonian may well move toward something approaching parity in at least the numbers of men and women scientists in the years ahead. For blacks and Hispanics, on the other hand, any prognosis based strictly on the size of the national pool of potential applicants with the requisite training must be guardedly long range at best. If we wish to assume a position offering any leadership with regard to the issues of representation that were mentioned earlier, we will need to find ways substantially to exceed the national averages.

Complicating the problem are specialized requirements that tend to be obscured by national aggregates like the ones cited. Our primary thrust in the biological sciences, for example, is in fields tied descriptively to classes of organisms. This is the historical focus of natural history museums. Since our collections remain a fundamental national resource for the solution of many practical problems such as those involving human health and disease, agricultural pest control, and wildlife management as well as for the advancement of basic scientific understanding, their conservation and systematic study remain an important priority today.

However, while this responsibility must continue to be met, it cannot suffice as our exclusive focus of interest. Were it to do so, we would be virtually unable to take cognizance of major biological breakthroughs at the cellular, molecular, and genetic rather than whole-organismic level. It would also mean that we could create few openings in the more health-related sciences, or in connection with agriculture and resource-related fields.

Yet let us suppose, as the evidence tends to indicate, that minorities have been somewhat more likely to pursue advanced training in the latter than in the former direction. Clearly, our opportunities to enlarge minority representation will increase in proportion to the total number who are present in our applicant pool. A widened, more flexible approach to staff recruitment—taking our programs in the direction of agriculture and other forms of human interaction with the environment, as well as into new subfields of biology—is a form of programmatic evolution that certainly appears to be more responsive to the Institution's long-term interests and responsibilities.

I should stress that this is only one illustration of an approach that must be adapted to individual occurrences throughout the Smithsonian that are characteristically differentiated. The challenges of representation are, in all

likelihood, less immediate and compelling in biology than in history, anthropology, and the arts. Since they deal directly with human cultures and societies, moreover, these latter subject areas can be addressed in a greater variety of ways.

While well aware that there is a great deal more to be done, I believe that in recent years the Smithsonian has made progress on several fronts. Much takes the form of concerts, lectures, symposia, performances, and educational activities. In addition, the role of minorities has been highlighted in a number of permanent and special exhibitions at the National Museum of American History, the National Museum of American Art, and the Anacostia Museum. Several years ago a Committee for a Wider Audience was established to review all our programs involving issues of representation and audience involvement. With regularly budgeted funds and external as well as internal members, it is actively pursuing its work. More recently it has been supplemented by a Cultural Education Committee, under the chair of Regent Jeannine Smith Clark, and with a prominent membership drawn largely from the Washington community. Questions of representation of minorities on the Smithsonian staff and sensitivity to cultural pluralism in our exhibit programs are among the principal themes of discussion in these bodies. Needless to say, they are also themes that are of great importance to Smithsonian management.

We at the Smithsonian must recognize that our very uniqueness and centrality as a national institution require that we assume a special role. It is understandable that many ethnic and cultural communities are particularly concerned with how well they are understood and represented in this setting. Demands for the correction of practices or exhibits directly concerning these communities are only to be expected and need to be met with a continuing sensitivity to the fact that, for the communities involved, the forms of recognition they achieve or fail to achieve at the Smithsonian may appear to be a significant indicator of their public standing.

A pertinent illustration may be provided by our ongoing discussions with members of a number of Native American communities and with representatives of national Indian leadership. Most are actively protesting the portrayal of traditional American Indian life in our ethnographic exhibits. They have also raised strong objections to the Smithsonian's retention of large American Indian skeletal collections for study, and to the utilization of materials from these collections in some of our exhibits on human biology. I do not want to minimize the seriousness of the differences that remain. It is a sufficient

measure of their complexity that scientific and legal as well as cultural considerations need to be taken into account and that legislation on some of them is pending in the Congress. But we are at least fortunate in being able to interact over the disputed details of our policies with the able intercession of two well-qualified American Indian scholars who are on our own staff as curators and colleagues.

In short, the importance of viewing actions from multiple perspectives cannot be overstressed if museums are to meet the growing challenges of, and sensitivities to, issues of representation. Beyond the legal and moral pressures to do so anyway, the enhancement of this capacity by encouraging greater staff diversity needs to be recognized as an imperative of Smithsonian policy.

The Year in Review

The Smithsonian capped the year with a grand celebration, the public unveiling of the Institution's new museum, research, and education complex. Crowned by the 4.2-acre Enid A. Haupt Garden, two jewel-like pavilions, and a kiosk that inspires whimsy, the splendid underground complex is the home of the Arthur M. Sackler Gallery—the fourteenth Smithsonian museum—the National Museum of African Art, the International Center, several offices, and state-of-the-art educational facilities.

The culmination of two decades of planning, four years of construction, and nearly a year of gallery preparation, the opening fulfilled a dream that originated with Secretary Emeritus S. Dillon Ripley in the late 1960s. Entered through separate pavilions, the Sackler Gallery and the Museum of African Art provide, as Ripley envisioned, a "window on the National Mall" for the civilizations of Africa, the Near East, and Asia. On the third and lowest level of the complex is the S. Dillon Ripley Center, which features the International Gallery, a fitting complement to the museums above. Here, the Smithsonian will present exhibitions that highlight the Institution's global endeavors, nurture understanding of other cultures, and focus attention on issues that span national boundaries. The Ripley Center also houses the National and Resident Associate Programs, the headquarters of the Smithsonian Institution Traveling Exhibition Service, and the Education Center, which includes classrooms, workshops, and a lecture hall.

During the Institution's 141-year history, the site of the new complex—the quadrangle of land now defined by the Castle, the Freer Gallery of Art, the Arts and Indus-



A young Baule weaver, photographed in Côte d'Ivoire. The photograph was made in preparation for "Patterns of Life: West African Strip Weaving Traditions," one of the inaugural exhibitions at the National Museum of African Art, which included examples of traditional textiles made by the Baule people.

tries Building, and Independence Avenue—had been home to an observatory, grazing buffaloes and other animals, various temporary structures, and a parking lot. With its elegant transformation, the Castle's South Yard now features truly world-class centers for exhibition, research, and education programs on the cultures of Africa and Asia.

In addition to marking a major step forward in the Smithsonian's mission to increase and diffuse knowledge, the opening was an occasion to pay tribute to those who made the complex possible. The \$73.2 million complex is the product of federal and private cooperation. A federal appropriation covered half the cost, with the remainder coming from the governments of Japan, South Korea,

and other nations; corporations; foundations; thirty-eight thousand Smithsonian Associates; other individuals; and Institution trust funds. New York philanthropist Enid A. Haupt donated \$3 million for the garden that bears her name. Arthur M. Sackler, whose death a few months before the opening greatly saddened all his Smithsonian friends, contributed one thousand masterworks of Asian art and \$4 million toward the construction of the museum named in his honor.

Hundreds of Smithsonian staff members, representing offices and bureaus across the Institution, contributed to this successful undertaking. The staffs of the Museum of African Art, the Sackler Gallery, the International Center, and the Smithsonian Institution Traveling Exhibition Service spent long hours readying the thirteen inaugural exhibitions for visitors to the new facility. The Office of Horticulture succeeded in fulfilling the wishes of donor Enid A. Haupt by creating an exquisite garden with a "mature look."

Important supporting roles were played by the Smithsonian National Associate Program, the Resident Associate Program, the Office of the Committee for a Wider Audience, and the other units that arranged special activities to showcase the new museums to the public. The Office of Public Affairs organized an all-day press conference for the media, attracting nearly three hundred representatives of ninety-eight publications and nineteen broadcast outlets. The attendance—the largest press draw in the Institution's history—and the resulting worldwide media coverage testified to the national and international significance of the museums. *Smithsonian* magazine devoted twenty-six pages to the garden and museums, and Smithsonian Institution Press provided able and timely assistance in ensuring that catalogues and other informational materials were ready for the opening. The Visitor Information and Associates' Reception Center prepared floor plans and trained docents to handle queries at its new information desks in the Sackler Gallery, the Museum of African Art, and the kiosk of the Ripley Center.

Several months before the opening, the Smithsonian Institution Libraries opened a new National Museum of African Art Branch, the Warren Robbins Library, and completed a major book-acquisition program that will enable the facility and its staff to provide valuable support to scholars of African art and culture. In addition, the Smithsonian Institution Archives initiated steps toward developing an archival program for the art museums. Behind-the-scenes efforts also included the work of the Institution's administrative offices, which attended

to the many important details involved in the planning, construction, and opening of a major new facility.

The opening was a fitting finale to a year that was notable in many other respects. The past twelve months were accented by the twentieth anniversary and relocation of the Anacostia Museum, the twenty-fifth anniversary of the National Portrait Gallery, major new initiatives in research and education, programs commemorating the Bicentennial of the U.S. Constitution, and the acquisition of Folkways Records, as well as many other significant additions to the Smithsonian collections.

The intended beneficiary of these activities is, of course, the American public, and statistics for 1987 indicate that the Institution is reaching an ever-larger portion of this broad audience. Despite three major snowfalls that virtually closed the entire city of Washington, D.C., attendance at the Institution's museums was up 13 percent in 1987. The thirteen museums in Washington, D.C., and the one museum in New York City counted 25.7 million visits in 1987, an increase of three million from the previous year. Part of the increase can be attributed to extended hours at several museums on the National Mall during Easter week in April and the summer months.

An additional one million people flocked to the Mall in June and July to partake in the diverse offerings of the 21st Festival of American Folklife, which commemorated Michigan's 150th anniversary as a state and celebrated—through music, crafts, oratory, and traditional ceremonies—the nation's rich ethnic composition.

For the majority of citizens who do not live in the Washington, D.C., area or who did not journey to the nation's capital in 1987, the Institution brought programs and services to them. Tours of exhibitions, organized by the Smithsonian Institution Traveling Exhibition Service, included stops at 396 sites, which were visited by an estimated ten million people. *Smithsonian* magazine was read by a monthly audience of about seven million, and *Smithsonian/Air & Space* magazine, which celebrated its first anniversary in April, served a circulation of three hundred thousand people, making it the largest publication of its kind.

In its third season, the cultural documentary series "Smithsonian World" was broadcast on Public Broadcasting Service stations across the nation. The short-feature series "Here at the Smithsonian" was aired on stations serving more than half the nation's households, and a potential three million listeners tuned in to "Radio Smithsonian."

The more than fifteen hundred daily and weekly news-

papers that subscribed to the Smithsonian News Service were supplied with a steady flow of information about the myriad activities and interests of the Institution. In addition, the office's Spanish edition of the Smithsonian News Service, launched in 1986, continued to serve more than one hundred Hispanic publications.

The Smithsonian National Associate Program organized a broad array of activities for its two million members and other interested members of the public. Some 670,000 families were invited to attend the National Associates Lecture and Seminar Program, with offerings at sites throughout the country. International and domestic travel and study tours organized by the National Associate Program drew seven thousand participants. Also in 1987, the number of Contributing Members, 90 percent of whom live outside the Washington, D.C., area, grew to 44,800, a one-year increase of 8 percent.

Functioning much like a university, the Smithsonian Resident Associate Program, which counted fifty-eight thousand members in 1987, organized eighteen hundred activities attended by some 260,000 people.

At the Smithsonian's hub—the Visitor Information and Associates' Reception Center—staff members and volunteers fielded questions from more than four hundred thousand telephone callers and responded to forty-seven thousand inquiries that arrived through the mail. Coming from scholars and members of the general public, thousands of other requests for information and assistance were handled directly by many of the Institution's offices and bureaus. The Smithsonian Institution Archives, for example, responded to sixteen hundred reference inquiries, aiding the efforts of researchers. The six regional centers of the Archives of American Art were visited by thirty-three hundred researchers, and the centers distributed nineteen hundred rolls of microfilm, containing copies of items in the art Archives' vast collections of records, to libraries throughout the country.

Scholars in the United States and abroad make up an important segment of the Smithsonian's audience. Hundreds visited the Institution in 1987 to further their studies and to consult with Smithsonian curators, scientists, and other members of the professional staff. These contacts, which are encouraged by a variety of grants and fellowship programs, have nourishing effects, promoting progress in specific lines of research and bringing valuable expertise to the Institution.

The scope of the Institution's diverse activities—in terms of geographic reach and range of topics in the arts and sciences—is broad indeed. But if it were not for the thousands of volunteers who contribute their time and

energy to the Institution, the breadth of the Smithsonian's efforts would be considerably narrower. In 1987, 5,244 volunteers played essential roles in nearly all units of the Institution. They staffed information desks, led tours, organized the annual Washington Craft Show and other fund-raising events, assisted curators and researchers, and performed numerous other tasks that benefited the Institution and its visitors.

Depending on their preferences, Smithsonian visitors can take vicarious trips to virtually any region of the world, explore the Solar System and beyond, immerse themselves in important periods of cultural and geological history, survey progress in fields of science and technology, or trace trends in schools and styles of art. These and the many other options confronting visitors were enhanced by the mounting of some one hundred new permanent and temporary exhibitions in 1987. A few of these exhibitions are described below.

To inaugurate its new home in Southeast Washington's historic Fort Stanton Park and to mark its twentieth anniversary, the Anacostia Museum (formerly the Anacostia Neighborhood Museum) featured "Contemporary Visual Expressions," an exhibition highlighting the work of four contemporary black American artists. Visitors to the new facility viewed the works of Sam Gilliam, Martha Jackson-Jarvis, Keith Morrison, and William T. Williams. While closed, preparing to move from the converted movie theater that had been its home, the museum shed its designation as a "neighborhood" museum. The change reflects the growing national and international recognition the museum has received for its role in explaining the social, political, and cultural contributions of black Americans. Programs undertaken at the new facility are likely to benefit from the fact that, for first time in the museum's existence, the entire staff is housed in the same building.

At the National Museum of American History, the exhibition "Field to Factory: Afro-American Migration, 1915-1940" retraced the large-scale movement of blacks from the rural South to the urban North. Known as the "Great Migration," the population shift not only profoundly affected the lives of the participants but also restructured American society. The exhibition featured two hundred objects that helped detail the personal experiences of the migrants and contrasted their living environment in the South with the surroundings they occupied in the North.

The National Museum of Natural History/National Museum of Man broke its annual attendance record, attracting eight million visitors in 1987. An important con-

tributing factor was "Portraits of Nature: Paintings by Robert Bateman." The major retrospective exhibition featured more than one hundred works by the Canadian painter, who is, perhaps, the foremost wildlife artist in the world today. More than 275,000 people toured the exhibition during its four-month run. Another exhibition, which will continue for several years, allowed visitors to observe the museum's technicians and specialists as they prepare a dinosaur skeleton for public display.

Celebrating its twenty-fifth anniversary in 1987, the National Portrait Gallery reinstalled its entire permanent collection. The reinstallation was completed with the opening of "Stage Portraits: Photographs by Mathew Brady from the Frederick Hill Meserve Collection." To commemorate its silver anniversary, the museum presented an exhibition of the works of Henry Inman, one of the preeminent figures in the field of portraiture during the first half of the nineteenth century.

At the Hirshhorn Museum and Sculpture Garden, exhibitions mounted in 1987 included "Nancy Graves: A Sculpture Retrospective," which surveyed the American artist's work from the late 1960s to the present, and "Lucian Freud," which featured seventy paintings and fourteen drawings by the British realist painter.

The Cooper-Hewitt Museum in New York City presented twelve new exhibitions. Among the varied offerings of the Smithsonian's National Museum of Design were "Milestones: Fifty Years of Goods and Services," which marked the fiftieth anniversary of the Consumers Union, and several exhibitions devoted to architecture, including one focusing on the work of Frank Lloyd Wright and another featuring the work of Louis Sullivan.

Noteworthy exhibitions at the National Museum of American Art included "Gene Davis, A Memorial Exhibition" and "John La Farge," the first retrospective of this innovative nineteenth-century artist in more than fifty years. The Renwick Gallery, a curatorial department of the National Museum of American Art, continued its tradition as a national showcase for American crafts. The Renwick's exhibition "American Art Deco," which also will be shown at four other museums, drew much critical acclaim.

Even the most avid visitors to the Smithsonian's new museum complex probably were overwhelmed by the exhibition choices. The National Museum of African Art presented five inaugural exhibitions "African Art in the Cycle of Life," "The Permanent Collection of the National Museum of African Art," "Objects of Use," "Patterns of Life: West African Strip-Weaving Traditions,"

and "Royal Benin Art in the Collection of the National Museum of African Art."

A stroll across the Enid A. Haupt Garden delivered visitors to the Arthur M. Sackler and its seven inaugural exhibitions of Asian art. The new museum's offerings were: "In Praise of Ancestors: Ritual Objects of China," "Monsters, Myths, and Minerals," "Pavilions and Immortal Mountains: Chinese Decorative Art and Painting," "Nomads and Nobility: Art of the Ancient Near East," "Persian and Indian Painting: Selections from a Recent Acquisition," "Temple Sculptures of South and Southeast Asia," and "Chinese Buddhist and Daoist Imagery."

In the complex's International Gallery, the subject was "Generations." The gallery's inaugural exhibition, organized by the Smithsonian Institution Traveling Exhibition Service, was a multicultural exploration of the arts and rituals associated with birth and infancy from ancient times to the present.

To mark the tenth anniversary of the Dibner Library, a collection of rare books on the history of science and technology, the Smithsonian Institution Libraries mounted the exhibition "Nota Bene." The display of twenty-nine books spanning 443 years featured volumes notable for their historical significance and for the curious annotations readers had inscribed in margins and flyleaves.

Preparing for a major construction project that will add much needed space and connect it to the Sackler Gallery, the Freer Gallery closed nine of its nineteen exhibition halls in 1987. A representative selection of works from the Freer's Chinese, Japanese, Indian, Near Eastern, and American collections remained on display.

The National Zoological Park and several museums added to their permanent exhibitions in 1987.

Continuing its transformation into a biological park, where the diversity and interdependence of plant and animal life are highlighted, the National Zoo opened its new "Invertebrate Exhibit." This exhibit features intriguing specimens of the more than 95 percent of animal species that do not have backbones. Visitors in 1987 were introduced to giant octopuses, sponges, amoebas, cuttlefish, leaf-cutter ants, and other invertebrates found on land and in water. Accompanying graphics, displays, and hands-on experiments foster understanding of biological processes.

With issues of competitiveness in manufacturing very much on the national agenda these days, a new exhibi-

tion at the National Museum of American History offers a comprehensive look at the nation's evolution from an agricultural economy to a world industrial power. "Engines of Change: The American Industrial Revolution, 1790–1860" features case studies that depict the development of American industry, focusing on the workers, inventors, entrepreneurs, and industrialists who contributed to the rise of U.S. manufacturing. The studies also tell the intertwined stories of the introduction of new machines and ways of organizing work.

At the National Air and Space Museum, "America's Space Truck," on display in the Space Hall, traces the evolution of the nation's Space Shuttle program, from the first launch in 1981, through the disaster of the *Challenger*, to the future. The museum also expanded its Stars Gallery with the addition of sections on the Hubble Space Telescope and on infrared astronomy. On display are a full-scale replica of the *Infrared Astronomy Satellite* and an array of other telescopes and detectors.

The Air and Space Museum also introduced "State of the Universe," an engrossing planetarium show that dramatizes how perceptions of the cosmos have changed with ever more sophisticated observing techniques.

Remodeling and reinstallation work at the Hirshhorn Museum and Sculpture Garden has allowed it to display more selections from its permanent collection, while creating special exhibition galleries and a small theater for visitor orientation programs.

Through the Smithsonian Institution Traveling Exhibition Service (SITES), the Institution brings its productions to people who live outside the Washington, D.C., area. In 1987, SITES exhibitions, many of them created in cooperation with other Smithsonian bureaus, were displayed at locations in forty-five states.

Among the eighteen new SITES offerings in 1987 was "Russia, The Land, The People: Russian Painting, 1850–1910," an exhibition featuring artworks from two of the Soviet Union's state-owned collections. Following its opening at the Renwick Gallery, the exhibition went on a ten-month tour, attracting a total of 250,000 visitors at its three stops. With its new additions, SITES now offers a total of 122 traveling exhibitions.

The Smithsonian added its contributions to the nationwide celebration of the Bicentennial of the U.S. Constitution, a five-year-long series of programs to commemorate the signing and ratification of the Constitution and the signing and ratification of the Bill of Rights. The Institu-

tion's Office of Interdisciplinary Studies focused its Ninth International Symposium on the theme "Constitutional Roots, Rights, and Responsibilities." At the week-long symposium, more than seventy internationally recognized scholars, educators, and jurists from the United States and abroad probed the Constitution's origins and development and discussed the two-hundred-year-old document's applicability to the present-day United States. The audience included students from around the country, and parts of the proceedings were broadcast by the Voice of America, C-Span, and Worldnet.

The Office of Elementary and Secondary Education organized a day-long seminar, "Teaching the Constitution," attended by 150 teachers and school administrators from the Washington area. The office also devoted an edition of its national publication for teachers, *Art to Zoo*, to teaching the concept of individual rights and responsibilities of citizenship. The Resident Associate Program organized four activities—one-day study tours to Philadelphia and to the Virginia home of James Madison, an all-day seminar, and a lecture by educator and lawyer Archibald Cox—that focused on issues and historical events related to the Constitution.

"Roads to Liberty: From the Magna Carta to the Constitution," a traveling exhibition designed and produced by the Office of Exhibits Central, was seen in 134 cities, ending its tour in Philadelphia on the anniversary of the signing of the Constitution. The exhibition was produced to support the efforts of the Commission on the Bicentennial of the U.S. Constitution and of the U.S. Constitution Council.

Exhibitions scheduled to open at the National Museum of American History and the National Portrait Gallery during the early part of the 1988 fiscal year will have constitutional themes. A variety of other exhibitions and programs are planned for the commemorative period. The Smithsonian's baseline inventory of its collections showed that the Institution is the nation's steward of 134 million objects, works of art, and scientific specimens. The vast majority (88 percent) of these items are in the collections of the National Museum of Natural History, which in the past year alone added about eight hundred thousand specimens.

The Institution's collections are national treasures. Collectively, they serve to preserve the past, enhance our understanding of nature and society—in the United States and throughout the world—safeguard irreplaceable works of art and material culture for future generations, and support research that expands knowledge in the arts

and sciences. Items added to the collections are given as gifts, gathered during scientific expeditions, or purchased.

In 1987, the Smithsonian acquired Folkways Records, the best-known publisher of commercial recordings of folk and tribal music in the United States and publisher of a historically significant collection of spoken-word recordings. Acquired from the estate of company founder Moses Asch, the Folkways Records catalogue contains more than twenty-two hundred albums.

The diverse collection includes music from early classical to electronic, documented recordings of more than seven hundred native peoples of the world, songs and games for children in several languages, and a science series with offerings ranging from the calls of North American frogs to an introduction to human biology. In addition to the current inventory of recordings, which is distributed by the Birch Tree Group, the Institution acquired the Folkways Archives, a gift from Michael and Frances Asch, the son and widow of the founder. The archives consists of Moses Asch's personal collections of books and records, field notes and recordings, business and personal correspondence, and cover art. This extensive collection of material is expected to be of great interest to researchers. The Smithsonian Institution Press and the Office of Folklife Programs will share responsibility for Folkways Records.

The National Museum of American Art was the recipient of gifts of two important collections. New York collector Herbert Waide Hemphill, Jr., donated 378 folk art objects, spanning the eighteenth to twentieth centuries. An important collection of paintings by American abstract artists of the 1930s and 1940s was given to the museum by Patricia and Phillip Frost of Miami Beach, Florida.

A 1785 portrait of Benjamin Franklin by J. S. Duplessis was one of several significant acquisitions of the National Portrait Gallery. The collection of the National Museum of African Art grew by forty-eight works of art, including a particularly noteworthy wooden figure carved by the Songye people of Zaire. The Cooper-Hewitt Museum enriched its holdings of extremely rare Oriental textiles with the purchase of a thirteenth-century needlework rendering of a bodhisattva, which is believed to have originated in China. Twenty-four gifts and ten purchases of paintings and sculptures were reported by the Hirshhorn Museum and Sculpture Garden. Among the notable additions to the Hirshhorn's collections were *Seguidilla*, a 1919 painting by Man Ray, and two bronze casts—*Angst*

and *Cubist Bust*—by Czechoslovakian sculptor Oto Gutfreund.

Acquisitions by the National Museum of American History reveal the eclecticism of the museum's interests. They included a Jarvik 7 artificial heart, a gown owned by Martha Washington, the original movie script for *The Wizard of Oz*, and the Gold Rush—a human-powered land vehicle that, in May 1986, achieved the record-setting speed of 65.48 miles per hour.

The collections of the National Air and Space Museum contain twenty-eight thousand artifacts related to the history of flight and space exploration. The museum added several historically significant aircraft in 1987, including *Voyager*, the first airplane to make a nonstop trip around the world without refueling.

Breeding programs at the National Zoological Park, designed to replenish zoo stocks and to serve as a hedge against the extinction of animals in the wild, resulted in 1,326 births during the 1986 calendar year. Among the newborns were a giraffe, a saurus crane, golden-lion tamarins, clouded leopards, Guam rails, Bali mynahs, and red-crowned cranes.

The zoo and millions of interested onlookers suffered a major disappointment in June 1987 with the death of twin cubs born to the zoo's giant panda Ling-Ling. One cub died almost immediately, apparently because it was undersized. The second, however, appeared strong enough to survive, but succumbed to a systemic infection three days after it was born.

An agreement concluded with the National Cancer Institute (NCI) in 1987 calls for the Smithsonian Oceanographic Sorting Center, which is administered by the National Museum of Natural History, to house and curate a voucher collection of nearly ten thousand marine plant, invertebrate, and fish specimens. The specimens are duplicates of those undergoing biochemical testing at NCI for potential anticancer substances. The specimens will be available for study by scientists from the Smithsonian and other institutions.

The Smithsonian's collections serve not only to preserve knowledge but also to extend it. The Institution encourages scholars and students worldwide to use its collections and to join its scientists and curators in their ongoing research programs. To foster these mutually beneficial collaborations, the Institution made awards to more than seven hundred students and scholars in 1987. The awards, administered by the Office of Fellowships



Evening Light-White Gyrfalcon by Robert Bateman. From the exhibition "Portraits of Nature: Paintings by Robert Bateman," January 17 thru May 17, 1987, at the National Museum of Natural History/National Museum of Man.

and Grants (OFG), are for lengthy residencies, which permit in-depth study; short visits, which may entail research, an examination of collections, or consultations with the Institution's professional staff; and for internships. Of the 172 visiting researchers who received assistance from OFG's Short Term Visitor Program in 1987, seventy-three were foreign scholars from thirty-one countries.

The activities of these important Smithsonian visitors comprised an extremely diverse research agenda. They pursued such topics as cultural nationalism in post-World War I American art, morphological and genetic variability in animal populations, the biology of larvae inhabiting coral reefs, the history of aerodynamics, the geology of Mars, and Timurid inscriptions on paintings in the collections of the Sackler and Freer galleries.

Scholarship and the exchange of ideas are also encouraged through conferences, workshops, and other activities. OFG, for example, provided support for sixteen

workshops designed to bring scholars together from a variety of fields to discuss subjects of common or complementary interest. The Office of Interdisciplinary Studies helped organize a variety of seminars and symposiums, including a novel one-day gathering on creativity in the arts and sciences.

Often, the Smithsonian convenes conferences to serve as catalysts to open new areas of investigation. In May, for example, the National Museum of Natural History summoned paleoecologists from the United States, Canada, England, and West Germany to assess current understanding of terrestrial environments from four hundred million years ago to the present. The aim of the conference, the first one ever devoted to this subject, was to establish a framework for addressing the biological impacts of the global demise of tropical forests.

The Office of Publications Exchange, founded by Joseph Henry, the Smithsonian's first secretary, continued its service to the international exchange of knowl-

edge. In 1987, the office handled 104,720 packages of scholarly materials from 149 domestic institutions for transmission abroad and 25,200 packages from foreign institutions for distribution in the United States.

Among the many benefits that flow from the Smithsonian's international scientific and cultural collaborations is the opportunity to enhance the American public's understanding of the histories, cultures, and natural environments of the many regions of the world. A 1985 cultural agreement between the Smithsonian and representatives of the Soviet Union, for example, resulted in the exhibition "Russia, The Land, The People: Russian Painting, 1850-1910." "New Horizons: American Painting, 1840-1910," the exchange exhibition organized by the Smithsonian Institution Traveling Exhibition Service, was scheduled to open in Moscow in November 1987.

Also during the past year, the Smithsonian, the Soviet Union Academy of Sciences, and the International Research Exchange Board signed an agreement specifying their cooperation in a major international exhibition on the cultures of the North Pacific region. Opening at the National Museum of Natural History in 1988, the exhibition, "Crossroads of Continents," will highlight the cultures of Alaska and Siberia from the end of the Ice Age to modern times. The exhibition will tour the United States and Canada until 1992, when it will be taken to Moscow, the first of several stops in the Soviet Union.

Other international endeavors in 1987 included the signing of a protocol of cooperation between the Institution and Iraq and the National Zoological Park's International Wildlife Conservation Training Program, which attracted twenty-four students from twelve countries. In addition, the Office of Museum Programs organized workshops for museum professionals that were held in Trinidad/Tobago and Costa Rica, and it organized special seminars for visitors from Spain, France, and the People's Republic of China. As well, the Office of Protection Services hosted and coordinated the 1987 International Conference on Museum Security.

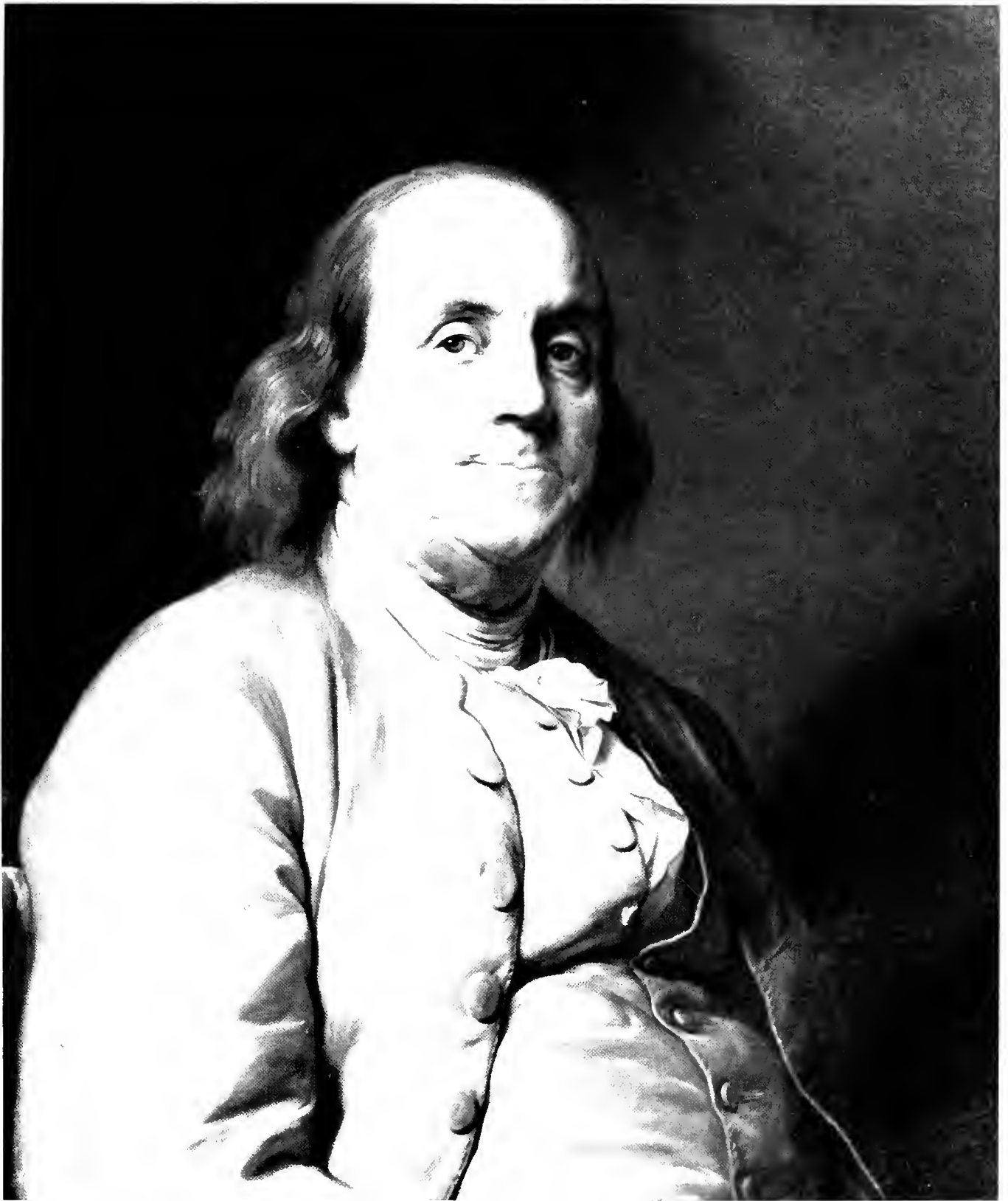
Subscribing to the view that learning is a lifelong pursuit, the Smithsonian places major emphasis on education and outreach activities for the public. The museums, the National Zoological Park, and many other units within the Institution offer specialized programs that bring the Smithsonian's educational resources to youngsters and adults. Moreover, these units are continually evaluating new techniques and strategies to enhance the learning value of exhibitions and other programs.

With the opening of the National Demonstration Laboratory for Interactive Educational Technologies in 1987, the Smithsonian features the first U.S. facility devoted entirely to achieving the full potential of one of the most powerful technologies of the Information Age. Interactive video technology offers exciting new ways for graphically presenting relationships between concepts and objects, prose and image, and sight and sound—all at the beckoning of the person in control of a computer keyboard. Beyond its educational applications, the tool is likely to spawn innovative methods for organizing, storing, archiving, and retrieving information, capabilities that have captured the interest of museums, television stations, schools, and government agencies. During its first three months of operation, the laboratory, which is jointly sponsored by the Smithsonian and a group of public television stations, hosted more than five hundred visitors who came to explore the technology and its applications.

The Smithsonian is also the new home of the National Science Resources Center, a program begun in 1985 by the Institution and the National Academy of Sciences. Offering a variety of resources and activities to improve the quality of science and mathematics instruction in the nation's elementary and secondary schools, the center initiated its first major project in 1987. The four-year undertaking, called "Science and Technology for Children," focuses on children in the first through sixth grades. Involving center staff and a national network of school systems, state departments of education, science museums, researchers, and education experts, the project will produce a series of scientific investigations designed to cultivate problem-solving and critical-thinking skills.

Programs for teachers were included among the activities of the Office of Elementary and Secondary Education, which works with other Smithsonian offices to encourage schools to use museums as extensions of the classroom. In 1987, the office organized three regional workshops for teachers, which were held in Jackson, Michigan; Waterloo, Iowa; and Philadelphia, Pennsylvania. The workshops were complemented by a variety of programs held in Washington, D.C., special activities for children, and the office's publications.

Collectively, the Smithsonian's exhibitions and educational activities—lectures, films, live performances, tours, field trips, in-depth courses, books, teachers' manuals, and others—seek to serve the varied interests of the Institution's diverse audience. To help ensure that these programs are accomplishing their objectives, Secretary Robert McC. Adams established an Advisory Council on Education. Composed of five outside experts with back-



Benjamin Franklin by Joseph S. Duplessis, oil on canvas. Purchase by the National Portrait Gallery made possible by the Morris and Gwendolyn Cafritz Foundation. (Photograph by Eugene Mantie)

grounds in art history, science, the media, education, and museums, the council will help the Institution's educational offices develop priorities and will advise the offices on designing specific programs to accomplish these goals.

Another advisory body formed in 1987, the Cultural Education Committee, will help the Smithsonian forge stronger links with cultural and ethnic groups that are underrepresented in the Institution's visitor and Associate membership programs. The committee, whose members represent many ethnic segments of the U.S. population, will advise the Office of the Committee for a Wider Audience and the senior management of the Smithsonian.

The creation of the ten-member body is a continuation of long-standing outreach efforts that have received renewed emphasis since the early 1980s. The results have been an expanding array of exhibitions and programs that convey the histories of the nation's cultural communities and reflect their roles in the country's development.

Last year's outreach efforts included the National Museum of American History exhibition "Field to Factory;" programs commemorating Black History Month, Hispanic Heritage Week, and Asian-Pacific Heritage Week; the Office of Public Affairs' new calendar of Smithsonian events for Hispanic organizations and media; an advertising campaign aimed at black audiences and carried out by the Office of Public Affairs and the Office of the Committee for a Wider Audience; and the many ethnic offerings of the Festival of American Folklife, such as the first in a continuing series of annual programs that highlight the musical traditions of the cultural communities in Washington, D.C.

In addition, the Office of the Committee for a Wider Audience and the Museum of American History's Program in Black American Culture sponsored a national conference to evaluate museum programs that have successfully integrated the histories and cultures of ethnic groups. The Museum of American History also initiated the Program in Hispanic American History. The program will explore critical themes in Hispanic American history, from colonial times to the present.

Efforts to reach more segments of the population are buttressed by programs designed to encourage greater involvement of minority scholars in Smithsonian research, which serves as the foundation for many of the Institution's other activities. A new program for Native Americans was added to existing awards and internships aimed at increasing the participation of minority students and scholars. Begun by the Office of Fellowships and Grants in cooperation with other bureaus, the program offers

short-term appointments to scholars from Native American communities. In 1987, seven appointments were made. The awards allowed the researchers to use Smithsonian resources in their studies of such topics as the breakup of the Sioux Nation and the role of women in contemporary trends in American Indian art.

An important component of the Smithsonian's mission is to extend the limits of understanding in history, the arts, and the sciences. In 1987, bureaus and offices undertook an array of investigations. Projects delved into the geological and cultural past, contemplated the future, spanned international boundaries, reached into the heavens, and furthered efforts to preserve the Earth's biological diversity.

Researchers at the Smithsonian Astrophysical Observatory, which is part of the Harvard-Smithsonian Center for Astrophysics (CfA), were at the forefront of studies of the brightest exploding star seen in more than four centuries. Discovered early enough after its explosion to allow detailed examination, the supernova—named SN 1987A—put scientists on the trail of new clues to stellar evolution.

CfA researchers used the full range of Earth- and space-based modern astronomical instruments to gather information about the rarely glimpsed phenomenon. From data collected by the *International Ultraviolet Explorer*, a CfA astronomer was the first to determine that SN 1987A's progenitor was the blue supergiant star Sanduleak -69 202. Working at the Cerro Tololo Inter-American Observatory in Chile, a team of center scientists made the surprising discovery of an enigmatic and inexplicably bright object near the supernova. Unobserved before the supernova, the companion object is suspected of being linked to the explosion, perhaps created by the violent stellar event. Months after the observation, the origin and nature of the object remained scientific quandaries.

Other CfA research in 1987 improved the accuracy of the measurement of the Earth's distance from the center of the Milky Way and led to a theory that could resolve a long-standing mystery of the Solar System—the origin of the Moon. On the basis of their study, two CfA scientists presented a convincing argument that the Moon was created by a collision between the Earth and another body perhaps 1.2 times the mass of Mars.

At the National Air and Space Museum, where interests extend from the history of aviation to the future of space exploration, research by members of the Center for Earth and Planetary Studies and their collaborators led to

new insights into the unusual topography of Mars. In the museum's Department of Space Science and Exploration, staff members and visiting scholars completed the second year of a project to evaluate the societal impact of large, publicly funded air and space programs.

Seeking to resolve questions about the effects of acid rain, scientists at the Smithsonian Environmental Research Center constructed a detailed "acid budget" for a mature forest lining the shore of the Chesapeake Bay. In addition to their many other findings, the group determined that forest vegetation and soil neutralized 98 percent of the acid in rain and snow; yet, the remaining 2 percent was sufficient to acidify waters draining into watershed streams.

Also at the Smithsonian facility in Edgewater, Maryland, researchers began a novel field experiment to assess the impact of increasing atmospheric concentrations of carbon dioxide on Chesapeake Bay plant communities. Contained in large open-top chambers, plants are being exposed to twice the current ambient levels of the "greenhouse gas." Measurements of the plants' rates of photosynthesis and other variables are being compared with measurements of the same variables for plants growing under normal conditions.

In September, a multidisciplinary team of scientists from the National Museum of Natural History began the first phase of an ambitious international project to inventory the unknown flora and fauna of Amazonia. Beginning in the Beni Reserve, a large expanse of virgin subtropical forest in Bolivia, the biodiversity inventory will not only add greatly to knowledge of the tropical-forest ecosystem, but is also expected to yield new sources of food, biological control agents, and germ-plasm resources. An important facet of the research effort is training. As the program expands, hundreds of young professionals and collaborators will receive scientific training in conjunction with inventories in their own countries.

Concern over decreasing biological diversity as a result of the Earth's shrinking expanses of tropical forest also prompted the Museum of Natural History to establish a program on the Evolution of Terrestrial Ecosystems. From the geological record, program scientists hope to determine how ecosystems have responded to catastrophic changes in the past. This information will help researchers gauge and predict the impact of deforestation and other major environmental changes under way today.

Two research successes at the National Zoological Park could eventually lead to breeding programs to help

check the threatened extinction of species of wild cats and of the black-footed ferret. An in-vitro fertilization system developed by zoo scientists resulted in "test-tube" kittens, the first carnivorous animals ever produced by such methods. Now that the system has been successfully demonstrated with domestic cats, researchers are working to extend the procedure to nondomestic cat species.

Another team of zoo researchers used artificial-insemination methods to produce common ferrets, nonendangered relatives of the nearly extinct black-footed ferret. The accomplishment introduces artificial insemination as an option for breeding programs to stem the decline of the black-footed ferret.

The broad-ranging programs of the Smithsonian Tropical Research Institute, located in Panama, continued to add to scientific understanding of the complexity and diversity of tropical biology and ecosystems. With financial support from the U.S. Department of Interior, institute scientists are evaluating the biological impacts of a 1986 oil spill near Galeta, site of the institute's mainland marine station on the Caribbean. An extensive monitoring program has been established, which will yield data that can be compared with information from the institute's past studies of the area. Using core samples of corals, which live for centuries and lay down annual rings, the team will also compare the oil spill's impact on coral growth rates with other growth-rate fluctuations during the past several hundred years.

Other projects at the institute included studies of natural selection, competition, and predation, as well as a promising demonstration project on returning degraded pastureland to useful agricultural production. The techniques developed in the project could eliminate the need to burn and clear new land for farming and thus relieve some of the development pressure on Panama's forests.

At the Conservation Analytical Laboratory, a multidisciplinary group of conservators, scientists, and engineers conduct studies on the conservation, examination, and characterization of museum objects. Among the projects begun in 1987 was an investigation of potential sources of ore for early Middle Eastern silver and bronze manufacture. Another new project is focusing on the earliest known ceramics, which date back to about 26,000 B.C. Discovered in Czechoslovakia, the artifacts include figurines of Venus and of mammoths, wolverines, and other animals. Conservation research included studies of the physical and chemical effects of various techniques for treating paper. As part of the laboratory's continuing studies of building climates, researchers initiated an investigation of the Renwick Gallery's reconstructed fa-



Teachers writing chemistry activities at the National Science Resources Center's Science and Technology for Children workshop held during the summer of 1987.

cade, installing sensors for continuous monitoring of humidity conditions and heat-transport phenomena.

An integral component of the Smithsonian's programs for scholars and the general public is its book and record-publishing activities and its film, television, and radio projects. In 1987, several new initiatives were begun, and past efforts were recognized for their excellence.

After only three seasons, "Smithsonian World," the public television series coproduced by the Institution and WETA, received a Primetime Emmy for Outstanding Informational Series. Moreover, "The Wyeths: A Father and His Family," one of the five "Smithsonian World" offerings during the year, was nominated for a News and Documentary Emmy.

Smithsonian magazine was selected as the winner of the Outstanding Magazine Award of the American Society of Journalists and Authors, Inc.

Records and books published by the Smithsonian Institution Press received many honors. The booklet accompanying *Virtuosi*, released in 1986 by the Press's Recording Division, won the ASCAP Deems-Taylor

Award for distinguished writing on the subject of music, and it was nominated for a Grammy Award. Among the Smithsonian Institution Press books receiving awards were *Gene Davis: A Memorial Exhibition*, *The Mystery of Comets*, and *Bachman's Warbler*.

In 1987, the Press published numerous books on art, history, and science. To commemorate the opening of the new museum complex, the Press conceived, developed, and published *A New View from the Castle*, an illustrated account of the complex's architecture and personae.

Smithsonian bureaus produced a variety of important exhibition catalogues, volumes on current research, bibliographies, and guides to collections and archives. The National Museum of American Art produced the six-volume *National Museum of American Art's Index to American Art Exhibition Catalogues, from the Beginning through the 1876 Centennial Year*. This comprehensive work, ten years in the making, contains a vast body of information—where, what, and how often an artist exhibited; artistic fashions and influences in particular geographic locations; and the provenance of specific works, as well as many other interesting items.

Three new scholarly journals were also introduced in 1987. The Oxford University Press published the first volume of *Smithsonian Studies in American Art*, a semi-annual journal from the National Museum of American Art, and the National Museum of American History introduced *Rittenhouse: The Quarterly Journal of the American Scientific Instrument Enterprise*. For scholars and Asian art enthusiasts in the general public, the Arthur M. Sackler Gallery offered *Asian Art*, a quarterly journal published in cooperation with the Oxford University Press.

Several developments during the past year promise continuing improvement in the Institution's efforts to fulfill its broad mission.

The \$2.7 million fund-raising campaign for the new Smithsonian Information Center reached a successful conclusion, allowing construction to commence in the fall of 1987. Housed in the Castle and expected to be ready in 1989, the new center will feature two orientation theaters, each seating about seventy people, and a variety of information and orientation aids, including video presentations—captioned in English and five foreign languages—and interactive video displays.

Construction began on the Earl S. Tupper Research and Conference Center at the Smithsonian Tropical Research Institute. The facility will house laboratories for staff members and visiting scientists, areas for growing plants and caring for research animals, and a 176-seat auditorium for conferences.

Preparations began for a major expansion of the Freer Gallery. The project will create an underground passage between the Freer and Sackler galleries, the Smithsonian's two Asian art museums. It also will triple space for conservation and technical study of artworks, and facilities for storing collections will increase 70 percent. Construction is scheduled to be completed by October 1989.

To improve service to the some nine million people who visit it each year, the National Air and Space Museum is adding a self-service cafeteria that can seat 800 people on the third level and a restaurant that will accommodate 180 on the mezzanine level. Scheduled to open in the fall of 1988, the eating facilities will be housed in an all-glass enclosure, offering views of the Capitol and the National Mall.

Staff Changes

The Smithsonian community endured quite a number of changes in personnel during fiscal year 1987 and once

again sustained too many irreparable losses. Of particular note was the untimely death of Dr. Arthur M. Sackler whose affinity to the Institution throughout much of the 1980s was of such an order that I and many of my associates considered him an intimate member of the Smithsonian family. We will remember him not only as an accomplished scientist, passionate collector, and connoisseur but also as an exemplar and supporter of all of the unities of creative life whose advancement lies at the heart of our mission.

During the year we winced repeatedly at the almost inevitable succession of top staff departures. For example, retirements this year included head of the Directorate of International Activities John E. Reinhardt, Director of the Office of Audits and Investigations Chris S. Peratino, Director of the Smithsonian National Associate Program Jacqueline F. Austin, Cooper-Hewitt Museum Founding Director Lisa M. Taylor, and Director of the Office of Telecommunications Nazaret Cherkezian. We have also lost by resignation both Director of SITES Peggy A. Loar to the Wolfsonian Foundation and Director of the Office of Information Resources Management Richard H. Lytle to Drexel University. And while we will miss him in the Smithsonian context, we were proud to see our colleague James H. Billington, who served since 1973 as the Director of the Woodrow Wilson Center for International Scholars, installed as the new Librarian of Congress.

While many searches have been launched to find suitable replacements for these esteemed comrades, none had reached a conclusion by year's end. We were nonetheless delighted to welcome Professor Martin O. Harwit of Cornell University as our new Director of the National Air and Space Museum. Similarly, as the year drew to a close we were pleased to confirm the appointments of Thomas E. Lovejoy as our new Assistant Secretary for External Affairs, Robert S. Hoffmann as successor to Assistant Secretary for Research David Challinor, Zahava D. Doering as a Special Assistant to the Secretary for Survey Research, and Madeleine S. Jacobs as the Director of the Office of Public Affairs, although we learned with great regret that Thomas Lawton would soon be resigning from the directorship of the Center for Asian Art.

In all of these changes we are reminded that the strength of the Smithsonian continues to be in its dedicated personnel, and those of us who remain feel a special debt of gratitude to those who have entrusted the Institution to our collective talents.

Report of the Board of Regents

With his installation as Chief Justice of the United States, William H. Rehnquist became a Regent of the Smithsonian Institution on September 26, 1987. Acting with dispatch to select a new Chancellor of the Institution, the chairman of the Executive Committee named a nominating committee composed of Messrs. Bowen (chair), Humelsine, Higginbotham, Gell-Mann, and Mrs. Armstrong. Conferring on October 1, the committee outlined the duties of the Chancellor and recommended that Chief Justice Rehnquist be nominated for election as Chancellor by the Board of Regents. After visiting with him in late October, Mr. Bowen indicated to the Regents the Chief Justice's willingness to serve, and accordingly a ballot for his election as the sixteenth Chancellor was distributed and affirmatively voted by the Regents in November.

Senator Daniel Patrick Moynihan also became a new Regent this year, filling the seat vacated with the retirement of Senator Barry Goldwater.

During 1987 there were two, rather than the customary three, meetings of the Board of Regents. Unusually heavy snowfalls in quick succession virtually paralyzed the city of Washington in late January and for the first time in memory forced the cancellation of the Board meeting scheduled for Monday, January 26. Nonetheless, much of the business of the meeting was transacted through mailed ballots. The Board's actions included the designation of Senator Goldwater as Regent Emeritus, approval of the *Five-Year Prospectus, Fiscal Years 1988-1992*, naming the "Patricia and Phillip Frost Gallery" in the National Museum of American Art, revision of the bylaws of the National Museum of American Art Commission, reappointments to that commission, and authorization of the Secretary's negotiation of most favorable terms for a Smithsonian credit card.

The spring meeting of the Board was held on Monday morning, May 11, in an International Center meeting room on the third subterranean level of the nearly completed Quadrangle building. The Audit and Review Committee of the Board reported on its most recent meeting, which focused particularly on the Smithsonian's affirmative action and equal opportunity programs. Noting the apparent lack of progress in increasing the representation of minorities and women in the professional ranks, the Board urged the Secretary to build pools of excellent minority scholars by means of more aggressive pre- and postdoctoral fellowship programs. After hearing a report of the Investment Policy Committee on the status of the endowment funds, the Board held an extensive discussion and voted to order the sale of the Institution's remaining investments in firms doing business in South Africa as

soon as practicable, consistent with the preservation of principal.

In other actions, the Board voted to name the third level of the Quadrangle building the S. Dillon Ripley Center in honor of the eighth Secretary's vision and accomplishments, to abandon the idea of a Smithsonian credit card but to encourage the study of launching a major capital campaign, to accept the annual report of the Secretary for fiscal year 1986, to name the Discover Graphics Workshop in honor of Gene Davis for his many contributions to the Smithsonian, to award the Henry Medal to retiring Cooper-Hewitt director Lisa Taylor, and to appoint and reappoint members of the National Portrait Gallery Commission, the Cooper-Hewitt Advisory Council, and the Commission of the National Museum of African Art.

In addition to giving consideration to a variety of other matters, the Regents engaged in an extensive discussion of the Institution's interactions with the concerns of national Indian organizations about Native American representation in Smithsonian exhibits and collections of Native American skeletal remains, legislation with respect to the repatriation of those remains and sacred objects, and the future of the Museum of the American Indian, Heye Foundation. While a number of divergent views were expressed, the Secretary was encouraged to work toward an agreement with the museum that would ensure the preservation and exhibition of the museum's collections, recognizing that the issue of the museum's relocation to Washington must first be settled in the New York courts.

A Regents' dinner was held in the Hall of Presidents of the National Portrait Gallery on Sunday evening, May 10, 1987. After dinner, the Secretary welcomed Chief Justice Rehnquist and Senator Moynihan as new Regents and presented to Dr. John Reinhardt the Secretary's Gold Medal for Exceptional Service along with a citation prepared in handsome calligraphy.

The final meeting of the Board for the year was held on September 28, 1987, in the largely refurbished Regents' Room. It was reported that the Executive Committee, acting on behalf of the Board, had designated the Arthur M. Sackler Gallery in perpetuity and approved the naming of the Hirshhorn auditorium in honor of Mr. and Mrs. Gustave Ring and the library of the National Museum of African Art in honor of founding director Warren Robbins. After discussing reports from their various committees, the Regents approved the appointment of former Senator Charles McC. Mathias to the Audit and Review and Personnel Committees, the Institution's

Benefactors

budget for fiscal year 1988 and requests and projections for fiscal year 1989, further revisions to the Bylaws of the Commission of the National Museum of American Art, and the naming of the garden between the Arts and Industries Building and the Hirshhorn Museum in honor of Mary Livingston Ripley. The Regents also held extensive discussions of a proposed policy of rotating independent auditors every ten years, suggested amendments to the Inspector General Act of 1978, the status of the endowment funds and their divestment of stocks in companies doing business in South Africa, the draft of the Five Year Prospectus for fiscal years 1989-93, the backlog of essential building maintenance and repairs, the Museum Support Center storage equipment, and the Museum of the American Indian.

In lieu of the traditional Regents' Dinner, on Sunday evening, September 27, the Board of Regents hosted a formal reception in the Concourse of the S. Dillon Ripley Center in honor of the opening of the National Museum of African Art, the Arthur M. Sackler Gallery, and the International Gallery. Speakers for the evening included Secretary Adams, Secretary Emeritus Ripley, and Chancellor Rehnquist.

On Monday, September 28, at noon, the Regents, invited staff and guests, and a good number of the visiting public gathered for a ribbon-cutting ceremony marking the opening of the Quadrangle facilities to the public. Following a musical prelude from the U.S. Navy Ceremonial Band, the ceremony began with an invocation from Rev. John R. Kinard, welcoming remarks from Secretary Adams, additional remarks from Secretary Emeritus Ripley and architect Jean Paul Carlhian, and a keynote address from Regent Anne L. Armstrong. The ceremony concluded with the speakers cutting a symbolic ribbon as Smithsonian guards cut ribbons at the doors and hundreds of balloons were released simultaneously from the National Museum of African Art, the Arthur M. Sackler Gallery, and the S. Dillon Ripley Center, which were then open to the public.

The Smithsonian gratefully acknowledges the support of the individuals, foundations, and corporations listed below, whose gifts, bequests, and contributing memberships aided the work of the Institution during the past fiscal year.

The Smithsonian owes its founding to the generosity of one individual. During most of its history since 1846, the Institution has relied upon a combination of both federal and trust funding to carry out the terms of James Smithson's will. As a trust instrumentality of the United States, the Smithsonian has received federal appropriations for research, exhibition of the national collections, and maintenance of the valuable objects of science, history, and culture entrusted to it.

The trust funds have been equally important, providing the Smithsonian with the flexibility and independence essential to its innovative growth. Such nonfederal funds traditionally have made possible many of the research, acquisition, and educational programs central to the Institution's achievements.

This list includes donors of \$1,000 or more. Certain donors have requested anonymity. If the name of any other donor has been omitted, it is unintentional and in no way lessens the Smithsonian's appreciation.

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The Smithsonian gratefully acknowledges here the generous support of the James Smithson Society and the Patron members (\$1,200) of the Contributing Membership Program.

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Financial Report

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The year was highlighted by the opening of the Enid A. Haupt Garden and the new museum complex in the Smithsonian's Quadrangle. This new museum complex, to be completed at a total project cost of \$73.2 million, houses the National Museum of African Art and the Arthur M. Sackler Gallery, a museum of Asian and Near Eastern Art. Also included in the complex is the S. Dillon Ripley Center, occupied by the Smithsonian Institution Traveling Exhibition Service, International Activities, and the Resident and National Associate Programs.

The complex, begun in June 1983, is funded with a combination of public and private monies. The federal government's \$36.6 million has been matched with \$36.6 million in private funds pledged and paid over a five-year period. The Institution can proudly boast that its newest capital additions to the Mall are fully paid for with no remaining debt, a rare occurrence among museums today and a tribute to Secretary Ripley's administration, which initiated this undertaking.

Operations

The Institution operated on solid ground for the fiscal year. Federal appropriations were sufficient to allow for the continuation and enhancement of major programs. Federal dollars are the principal source of core support for the Institution's continuing programs of research, exhibitions, education, and collections management as well as related administrative and support services.

New initiatives funded by federal monies included making the facilities' programs in the Quadrangle fully operational. Important scientific programs in biological diversity and tropical forest biology received support. The purchase of the Duke Ellington Collection for the National Museum of American History stands out among the many notable acquisitions funded with federal funds.

For the fiscal year ending September 30, 1987, federal appropriations initially provided \$183,920,000 to fund ongoing operations. Subsequently, a supplemental appropriation, primarily for pay increases and the cost of the new Federal Employees Retirement System, increased the total to \$188,974,000, which was \$19.6 million higher than in fiscal year 1986. A total of \$343,000, less than two-tenths of 1 percent of the year's appropriations, was returned to the Treasury at year end as uncommitted salaries and expenses for fiscal year 1987.

The Institution also benefited from specific project grants and contracts totaling \$15,873,000 from government agencies and bureaus. These monies continue to

constitute an important source of research funding, most notably for the Smithsonian Astrophysical Observatory and the National Museum of Natural History National Museum of Man. The grantors gain access to Smithsonian expertise and resources, particularly in astrophysics and biological studies.

Trust funds, that is nonappropriated income from gifts, grants, endowments, current investments, and revenue-producing activities, provided supplemental base support as well as that extra margin for experimentation and bold initiatives. In this context, \$1,205,000 of net trust income was specifically allocated for acquisitions, \$2,700,000 for special exhibitions, \$2,839,000 for fellowships, \$2,300,000 for scholarly research, and \$550,000 for educational outreach. These funds are in addition to regularly budgeted trust funds for similar purposes at the bureau level.

Examples of new ventures funded by nonappropriated funds during fiscal 1987 include the establishment of the Regents Publication Fund, symposia on the Bicentennial of the Constitution, opening events for the Quadrangle, development of needed financial systems, and an exhibition celebrating the fiftieth anniversary of Superman. Expenditures necessary to generate trust revenues, such as those for publishing *Smithsonian Magazine*, contribute in and of themselves to fulfilling James Smithson's mandate to increase and diffuse knowledge.

Source of Funds	Gross Revenues (\$1,000s)	Net Income (\$1,000s)	Net Income (%)
Federal			
Appropriation	188,974	188,974	72
Government			
Grants and			
Contracts	15,873	15,873	6
All Trust Sources	<u>195,080</u>	<u>57,239</u>	<u>22</u>
Total Available for Operations	399,927	262,086	100

Trust fund income was sufficient to restore the unrestricted trust fund balance to its previous level of approximately \$5,000,000. The fund balance had dropped to \$2,044,000 in fiscal year 1986 with the Regents' permission as the Institution funded the purchase of two major collections in connection with the anticipated opening of

the Quadrangle museums. The unrestricted trust fund balance provides the working capital base for the Institution.

An amount of \$3,000,000 from revenues generated by the Institution's business activities was transferred to endowment, in keeping with past practices aimed at strengthening this important asset. In addition, significant reserves were set aside to assure timely completion of two major construction projects now under way: the underground passageway between the Freer Gallery and the Quadrangle and the new restaurant addition to the National Air and Space Museum. Construction at the National Air and Space Museum is being funded solely with trust funds utilizing an \$11,000,000 loan from the Riggs Bank, supplemented by monies made available from auxiliary activity revenues.

Fund-raising Results

Restricted gifts and grants from individuals, foundations, and corporations for operations increased by 57 percent over the previous year, reflecting an increased emphasis on fund-raising activities within the Institution. These monies, as designated by the donors, were used variously to supplement unrestricted trust funds or to fund projects for which institutional support was unavailable. The Smithsonian is especially grateful to all who contributed. A fuller detailing of contributions may be found in the section "Benefactors of the Smithsonian Institution in 1987." Particular mention is made here of two volunteer groups associated with the Institution, The Women's Committee of the Smithsonian Associates and the Smithsonian Society, for their continuing sponsorship of important initiatives.

The most wide-reaching fund-raising campaign since that undertaken for the Quadrangle was launched within the Smithsonian family in fiscal year 1987 for monies to renovate the Great Hall of the Castle and to construct a Visitors' Information Center in that space. This center will include a reception area featuring a pan-institutional exhibition, maps and models detailing the location of Smithsonian museums and other popular attractions in the nation's capital, and two orientation theaters. In all, approximately \$3,200,000 has been raised or pledged. More than \$1,000,000 in gifts from the Smithsonian National Associates will be used to match a \$1,000,000 grant from the Pew Foundation and \$500,000 from the Kresge Foundation designated for this project.

Acquisitions and Deaccessioning

The Institution uses multiple sources for the purchase of new collection items—limited federal funds, the above-mentioned monies made available from unrestricted trust funds, restricted gifts, and monies generated by the sale of deaccessioned items. During fiscal year 1987, this last source played an important role in securing for the National Museum of American Art and the Hirshhorn Museum and Sculpture Garden important additions to their collections.

At the National Museum of American Art, the sale of a seventeenth-century Italian painting by Guercino brought proceeds of \$1.45 million. This was the primary source of funds for the purchase of the Hemphill Collection, an important collection of folk art. Similarly, the Hirshhorn sales made possible the purchase of a sculpture by Jasper Johns, a 1919 Man Ray spray painting, and a more recent work by Lucian Freud.

Construction and Plant Funds

For the most part, Smithsonian buildings are properties of the federal government under the control of the Board of Regents. Each year, in addition to its appropriation for salaries and other operating expenses, the Institution receives appropriations for the restoration and renovation of these facilities and for specific new construction. In fiscal year 1987, \$19,070,000 was appropriated for these purposes. A separate federal appropriation of \$2,500,000 was provided specifically for the National Zoological Park, primarily for the completion of the Olmsted Walkway.

During the course of the year, work commenced on fire detection and suppression systems at several museums, the courtyard renovation project at the Freer Gallery of Art, laboratory and shop additions at the Smithsonian Environmental Research Center, and the major renovation of utility systems. Progress was made on the Earl S. Tupper Research and Conference Center at the Smithsonian Tropical Research Institute, with funds provided jointly from federal appropriations and a gift from the Tupper family. This project is slated for completion in September 1988.

Endowment

The Smithsonian's endowment fund reached an all-time high of \$234,120,769 on September 30, 1987. Institutional

euphoria was tempered on "Black Monday." As of December 31, as indicated in the footnotes of the accompanying audit report from Coopers and Lybrand, the endowment was valued at \$188,400,000. This represents a 19 percent loss from September 30 versus a 25 percent drop in the Dow Jones Industrial Average for the same three-month period.

Historically, the Smithsonian's endowment fund has been equity oriented. With the appointment at the end of fiscal year 1986 of Miller, Anderson and Sherrerd to manage a balanced portfolio, the Investment Policy Committee signaled a move toward more portfolio diversification. By December 31, 1987, the portfolio had the following asset mix: 62 percent equities, 21 percent fixed income, and 18 percent cash or cash equivalent.

The Institution's Investment Policy Committee takes an active role in endowment management, continually reassessing the performance and effectiveness of the investment managers. We are grateful to our committee members who have given generously of their time and expertise: Regent Barnabas McHenry, who serves as chair; Regent Carlisle Humelsine; Donald Moriarity; Charles H. Mott; William R. Saloman; Thomas J. Watson; and Jane Mach Gould. The Institution's managers are Miller, Anderson and Sherrerd; Fiduciary Trust Company of New York; Batterymarch Financial Management; and Nova Advisors. Managers operate with full discretion within guidelines set by the committee and in consultation with the Board of Regents.

The Regents at their May 1987 meeting ordered the sale of the Institution's remaining investments in Sullivan signatory companies doing business in South Africa. Divestment began soon thereafter and was substantially completed by September 30 without loss to the portfolio. The last disposition was made on November 5, 1987.

Financial Management Activities

After several years of evaluation and planning, fiscal year 1987 saw significant progress and accomplishment within the Treasurer's Office. As noted in past annual reports, the Treasurer's Office encompasses diverse fiscal responsibilities as well as business management activities. The Office of Accounting and Financial Services, the Office of Financial Management and Planning, and the Office of Risk Management report directly to the Treasurer. These offices are jointly responsible for the systems and for the control, security, and disposition of the funds detailed in the accompanying reports.

As the fiscal year closed, the Institution was poised to implement a new payroll/personnel system utilizing the services of the Department of Agriculture's National Finance Center. The first payroll on this system was successfully processed on November 5. The Institution's old patchwork system relied heavily for nearly two decades on extensive manual effort. The new system is continuously current and consistent with federal standards, documented, and almost entirely automatic, thereby expediting payroll processing and reporting.

The Treasurer wishes to express the Institution's indebtedness to Clyde G. McShan II, Director of the National Finance Center, and his staff for their willingness to adapt an essentially federal system to the Smithsonian's special needs. Readers may be unaware that the Smithsonian has two well-integrated but technically distinct staffs. There are approximately 4,300 federal employees and 1,300 nonfederal or trust-funded employees.

Equal gratitude goes to the more than fifty people within the Institution who by their tireless efforts made the conversion possible. Under the guidance of the Treasurer, a special task force headed by Joseph Vasquez, Howard Toy, and Shireen Dodson spearheaded the effort of staff in the Office of Personnel Administration, the Office of Accounting and Financial Services, and the Office of Information Resource Management. They were assisted by Price Waterhouse consultants.

During the course of the year, Financial Management staff reviewed custodial services available from various financial institutions. An agreement was entered into with Manufacturers Hanover Bank and implemented in July 1987. The Institution now has direct computer-linked access to its investment portfolio and obtains a wealth of comparative statistical data from this source.

Business Management Activities

Under the watchful eye of the Treasurer and the Business Manager, James J. Chmelik, it was a hectic but rewarding year for the Museum Shops, the Mail Order Division, Product Development and Licensing, and Concessions. Museum Shops opened the highly acclaimed shop in the new Museum of African Art, an imaginatively refurbished shop at the National Air and Space Museum, and the dynamic first floor shop at the Hirshhorn. The success of these enterprises is a tribute to the unstinting efforts of Museum Shops Director, Samuel J. Greenberg, and his retail specialists.

Changing market conditions and customer preferences affected Mail Order Division sales. While still a very healthy contributor to unrestricted trust funds, Mail Order did not experience the growth of past years, and the Institution was led to reevaluate its marketing and merchandising efforts. The fledgling Product Licensing and Development Division, however, scored notable triumphs timed to coincide with the opening of the Quadrangle. Kravet Fabrics was licensed to reproduce textiles based upon patterns from the Museum of African Art Collection; Century Furniture brought to market reproductions of the garden furniture integral to the Enid A. Haupt Garden.

New food service vendors, Guest Services Incorporated, and Daka Corporation, began operations at the Smithsonian in November 1986. The transition was accomplished with minimal disruption in service. Net income from Concessions, primarily as a result of the new food service agreements, was up 85 percent over the preceding year. In March 1987, the Institution broke ground for a restaurant addition at the National Air and Space Museum. This facility will greatly expand food services on the Mall beginning in the fall of 1988.

Audit Activities

The Institution's funds, federal and nonappropriated, are audited annually by the independent public accounting firm of Coopers and Lybrand. Coopers and Lybrand's consulting staff provided assistance to the Institution with respect to allocations for computer cost centers, management of business activity inventories, financial reporting for food services activities, and Quadrangle construction costs. Coopers and Lybrand's unqualified report for fiscal year 1987 is reprinted on the following pages.

The Smithsonian's internal audit staff regularly reviews the Institution's financial activities and fiscal systems, assists the outside auditors, and does special projects as required. In addition, the Defense Contract Audit Agency conducted audits of grants and contracts received from federal agencies and monitored allocated administrative costs.

The Audit and Review Committee of the Board of Regents, chaired by Regent David C. Acheson, met three times during the fiscal year pursuant to responsibilities under legislation, the legal nature of the Institution, and the bylaws of the Board of Regents. In addition to reviewing the 1986 audit performed by Coopers and Lybrand and their 1987 audit plan, the committee reviewed reports from the Office of Audits and Investigation and a wide variety of the Institutional programs and activities.

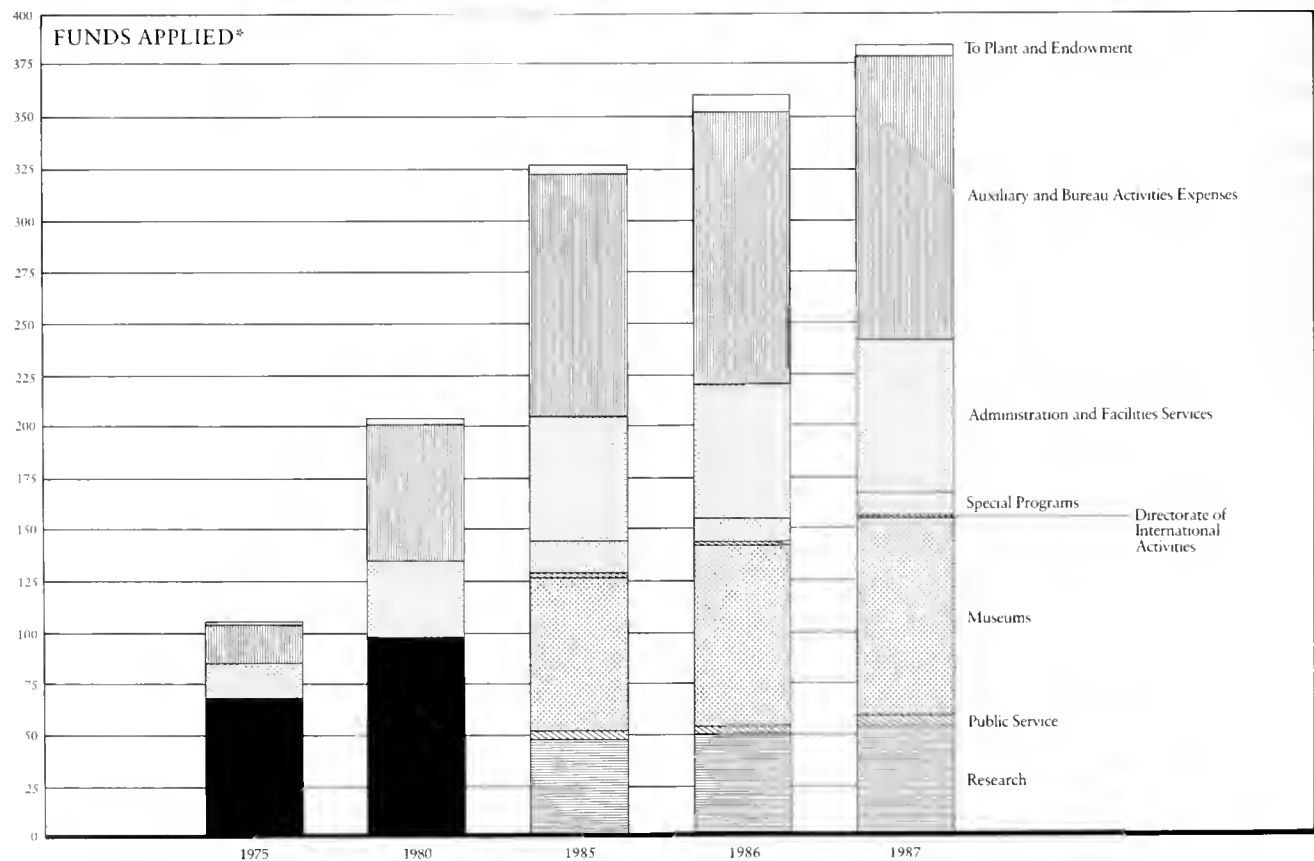
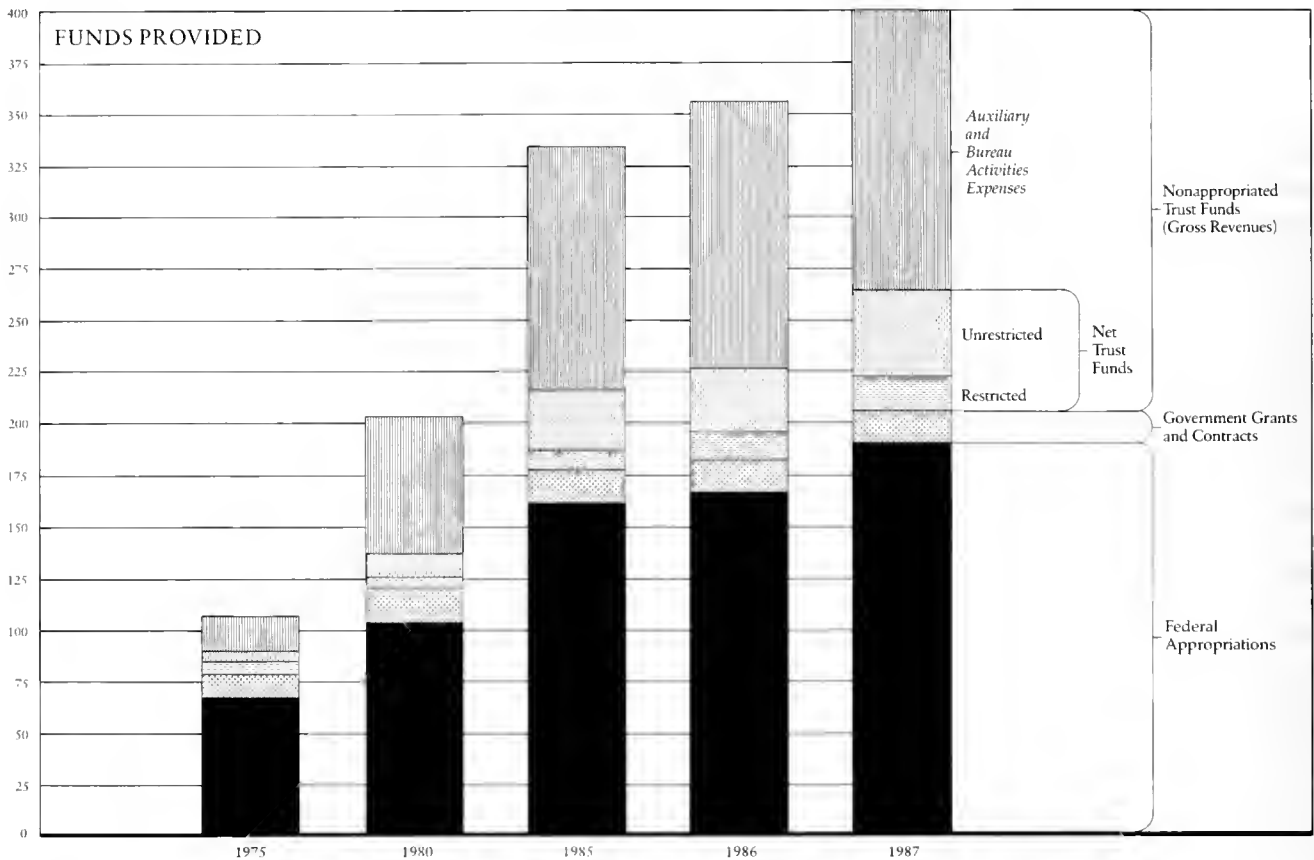
Related Organizations

The Woodrow Wilson International Center for Scholars, the National Gallery of Art, and the John F. Kennedy Center for Performing Arts were established by Congress within the Institution. Each organization is administered by its own board of trustees and reports independently on its financial status. The Smithsonian provides the Woodrow Wilson International Center for Scholars fiscal, administrative, and other support services in addition to office space on a reimbursement basis. Administrative services are provided by the Institution on a contract basis for Reading Is Fundamental. Office space continues to be provided for Visions Foundation, Inc., a nonprofit organization that publishes *American Visions* magazine. An independent nonprofit operation, the Friends of the National Zoo, operates under contract for the benefit of the National Zoological Park.

Smithsonian Institution Operating Funds

FISCAL YEARS 1975, 1980, 1985, 1986, 1987

(In \$1,000,000's)



*Historical data for certain categories are summarized for 1975 and 1980.

Table 1 Financial Summary (In \$1,000s)

	FY 1986	FY 1987
INSTITUTIONAL OPERATING FUNDS		
FUNDS PROVIDED:		
Federal Appropriations—Salaries & Expenses	\$169,384	\$188,974
Government Grants & Contracts	15,534	15,873
Nonappropriated Trust Funds:		
For Restricted Purposes	13,314	16,518
For Unrestricted & Special Purposes:		
Auxiliary & Bureau Activities Revenues—Gross	153,166	166,737
Less Related Expenses	(131,571)	(137,841)
Auxiliary & Bureau Activities Net Revenue	21,595	28,896
Investment, Gift & Other Income	7,982	11,825
Total Net Unrestricted & Special Purpose Revenue	29,577	40,721
Total Nonappropriated Trust Funds—Gross	174,462	195,080
—Net	42,891	57,239
Total Operating Funds Provided—Gross	359,380	399,927
—Net	<u>\$227,809</u>	<u>\$262,086</u>
FUNDS APPLIED:		
Research	\$ 52,463	\$ 56,452
Less SAO Overhead Recovery	(2,654)	(2,545)
Museums	89,765	95,632
Public Service	4,229	5,301
Directorate of International Activities	1,387	1,427
Special Programs	11,740	11,642
Associates & Business Management	1,043	1,258
Administration—Federal*	12,726	15,112
Nonappropriated Trust Funds	8,474	9,889
Less Smithsonian Overhead Recovery	(8,491)	(9,305)
Facilities Services	51,302	57,271
Total Operating Funds Applied	221,984	242,134
Transfers (Nonappropriated Trust Funds)		
Unrestricted Funds—To Plant	87	(255)
—To Endowment	5,733	3,278
Restricted Funds—To Endowment	2,314	570
Total Operating Funds Applied & Transferred Out	<u>\$230,118</u>	<u>\$245,727</u>
CHANGES IN NONAPPROPRIATED TRUST FUND BALANCES:		
Restricted Purpose (Including Government Grants & Contracts)	\$ (28)	\$ 4,113
Unrestricted—General Purpose	(3,094)	3,132
—Special Purpose	813	9,114
Total	<u>\$ (2,309)</u>	<u>\$ 16,359</u>
YEAR-END BALANCES—NONAPPROPRIATED TRUST FUNDS:		
Restricted Purpose	\$ 9,656	\$ 13,769
Unrestricted—General Purpose	2,044	5,176
—Special Purpose	24,645	33,759
Total	<u>\$ 36,345</u>	<u>\$ 52,704</u>
OTHER FEDERAL APPROPRIATIONS **		
Special Foreign Currency Program	\$ 2,378	\$ —
Construction	19,621	21,570
Total Federal Appropriation (Including S & E above)	<u>\$191,383</u>	<u>\$210,544</u>

* Includes unobligated funds returned to Treasury: FY 1986—\$185,000; FY 1987—\$343,000.

** Excludes \$1,477,000 received in FY 1986 and \$1,585,000 received in FY1987 from the Department of State for research projects in India.

Table 2 Source and Application of Operating Funds for the Year Ended September 30, 1987
(Excludes Special Foreign Currency Funds, Plant Funds, and Endowments) (In \$1,000s)

	Nonfederal Funds						
	Federal Funds	Total Non-federal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Government Grants and Contracts
FUND BALANCES—10/01/86	\$ —	\$ 36,345	\$ 2,044	\$ —	\$ 24,645	\$ 9,656	\$ —
FUNDS PROVIDED:							
Federal Appropriations	\$188,974	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —
Investment Income	—	11,248	5,311	520	900	4,517	—
Government Grants and Contracts	—	15,873	—	—	—	—	15,873
Gifts	—	14,840	74	4,477	316	9,973	—
Sales and Membership Revenue	—	161,740	—	152,537	9,203	—	—
Other	—	7,252	51	—	5,173	2,028	—
Total Provided	<u>188,974</u>	<u>210,953</u>	<u>5,436</u>	<u>157,534</u>	<u>15,592</u>	<u>16,518</u>	<u>15,873</u>
Total Available	<u>\$188,974</u>	<u>\$247,298</u>	<u>\$ 7,480</u>	<u>\$157,534</u>	<u>\$ 40,237</u>	<u>\$ 26,174</u>	<u>\$ 15,873</u>
FUNDS APPLIED:							
<i>Research:</i>							
Assistant Secretary	\$ 1,374	\$ 1,311	\$ 78	\$ —	\$ 28	\$ 596	\$ 609
Astrophysical Observatory	9,920	16,547	2,580	—	1,826	42	12,099
Less Overhead Recovery	—	(2,545)	—	(2,545)	—	—	—
Tropical Research Institute	4,198	1,852	155	—	756	473	468
Environmental Research Center	1,960	603	77	—	91	17	418
National Zoological Park	12,372	775	138	—	408	179	50
Smithsonian Archives	591	172	171	—	1	—	—
Smithsonian Libraries	5,116	453	390	—	39	24	—
Total Research	<u>35,531</u>	<u>19,168</u>	<u>1,044</u>	<u>—</u>	<u>3,149</u>	<u>1,331</u>	<u>13,644</u>
<i>Museums:</i>							
Assistant Secretary	593	163	140	—	17	6	—
Museum Programs	428	389	7	—	55	326	1
National Museum of Natural History/Museum of Man	22,300	4,245	280	—	1,381	1,781	803
National Air & Space Museum	8,940	4,292	155	—	3,021	534	582
National Museum of American History	13,009	2,563	184	—	1,048	1,263	68
National Museum of American Art	4,618	3,413	39	—	2,742	631	1
National Portrait Gallery	4,365	367	18	—	120	208	21
Hirshhorn Museum	3,282	1,320	11	—	329	980	—
Center for Asian Art	3,941	2,339	154	—	27	2,158	—
Archives of American Art	1,008	868	87	—	6	775	—
Cooper-Hewitt Museum	1,000	3,119	825	—	1,494	724	76
National Museum of African Art	3,026	1,548	134	—	1,348	66	—
Anacostia Neighborhood Museum	868	39	37	—	2	—	—
National Museum Act	21	—	—	—	—	—	—
Conservation Analytical Laboratory	2,402	78	—	—	21	55	2
Office of Exhibits Central	1,701	(60)	—	—	(60)	—	—
Traveling Exhibition Service	635	3,425	250	—	2,653	399	123
Total Museums	<u>72,137</u>	<u>28,108</u>	<u>2,321</u>	<u>0</u>	<u>14,204</u>	<u>9,906</u>	<u>1,677</u>

Table 2 Source and Application of Operating Funds Year Ended September 30, 1987
 (Excludes Special Foreign Currency Funds, Plant Funds, and Endowments) (In \$1,000s)

	Nonfederal Funds						
	Federal Funds	Total Non-federal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Government Grants and Contracts
<i>Public Service:</i>							
Assistant Secretary	259	605	495	—	82	28	—
Telecommunications	268	730	513	—	154	63	—
Reception Center	192	782	780	—	—	2	—
Office of Public Affairs	607	527	504	—	23	—	—
Smithsonian Press	1,110	12,183	58	11,880	241	—	4
Total Public Service	2,436	14,827	2,350	11,880	500	93	4
Directorate of International Activities	622	805	651	—	85	51	18
<i>Special Programs:</i>							
American Studies & Folklife Program	764	1,257	572	—	86	69	530
International Environmental Science Program ...	714	—	—	—	—	—	—
Academic & Educational Program	854	2,618	451	—	1,966	201	—
Collections Management/Inventory	901	—	—	—	—	—	—
Museum Support Center	4,475	127	—	—	127	—	—
JFK Center Grant	0	—	—	—	—	—	—
Total Special Programs	1,708	4,002	1,023	—	2,179	270	530
Associate Programs	—	81,386	927	80,116	298	45	—
Business Management	—	38,752	—	38,752	—	—	—
Administration	14,769	11,187	8,650	—	2,413	124	—
Less Overhead Recovery	—	(9,305)	(9,305)	—	—	—	—
Facilities Services	55,428	2,071	1,704	—	364	3	—
<i>Transfers Out/(In):</i>							
Treasury *	343	—	—	—	—	—	—
Programs**	—	—	6,355	—	(6,355)	—	—
Net Auxiliary Activities	—	—	(25,373)	25,373	—	—	—
Other Designated Purposes	—	(255)	8,923	1,413	(10,603)	12	—
Plant	—	—	—	—	—	—	—
Endowment	—	3,848	3,034	—	244	570	—
Total Transfers	343*	3,593	(7,061)	26,786	(16,714)	582	—
Total Funds Applied	\$188,974	\$194,594	\$ 2,304	\$157,534	\$ 6,478	\$ 12,405	\$ 15,873
FUND BALANCES 9/30/87	\$ —	\$ 52,704	\$ 5,176	\$ —	\$ 33,759	\$ 13,769	\$ —

*Unobligated funds returned to Treasury

**Includes Collection Acquisition, Scholarly Studies, Educational Outreach, and Special Exhibitions Programs.

Table 3 Government Grants and Contracts—Expenditures (In \$1,000s)
Fiscal Years 1986 and 1987

Government Agencies	FY 1986	FY 1987
Agency for International Development	\$ 763	\$ 426
Department of Commerce	37	15
Department of Defense	1,676	1,437
Department of Energy	509	731
Department of Health and Human Services	461	274
Department of Interior	319	616
National Aeronautics and Space Administration*	10,992	10,951
National Science Foundation**	675	666
Other	474	757
Total	\$15,906	\$15,873

*Includes \$420,000 (FY 1986) and \$273,700 (FY 1987) in subcontracts from other organizations receiving prime contract funding from NASA.

**Includes \$261,000 (FY 1986) and \$158,900 (FY 1987) in NSF subcontracts from the Chesapeake Research Consortium.

Table 4 Restricted Operating Trust Funds*
Fiscal Years 1986 and 1987 (In \$1,000s)

	Investment	Gifts	Miscellaneous	Total revenue	Deductions	Transfers in (out)	Net increase (decrease)	Fund balance end of year
FY 1986	<u>\$4,046</u>	<u>\$6,318</u>	<u>\$2,950</u>	<u>\$13,314</u>	<u>\$10,622</u>	<u>\$(2,348)</u>	<u>\$ 344</u>	<u>\$ 9,656</u>
FY 1987:								
Astrophysical Observatory	\$ 32	\$ 13	\$ —	\$ 45	\$ 42	\$ 1	\$ 2	\$ 13
Tropical Research Institute	78	97	—	175	473	—	(298)	198
National Zoological Park	26	195	9	230	179	—	51	279
Other Research	299	756	2	1,057	637	156	264	817
Museum Programs	11	155	—	166	326	—	(160)	95
National Museum of Natural History.....	1,556	527	15	2,098	1,782	14	302	1,571
National Air and Space Museum.....	139	888	1	1,028	534	—	494	1,091
National Museum of American History.....	209	2,012	5	2,226	1,263	(1)	964	2,681
National Museum of American Art..	78	681	7	766	631	—	135	381
National Portrait Gallery	14	178	—	192	208	—	(16)	180
Hirshhorn Museum	135	135	1,398	1,668	980	400	288	544
Center for Asian Art	1,578	418	514	2,510	2,158	(2)	354	2,043
Archives of American Art	49	906	181	1,136	775	—	361	666
Cooper-Hewitt Museum	100	704	9	813	724	—	89	1,060
Traveling Exhibition Service	37	1,078	—	1,115	417	—	698	940
Other Museums	31	433	2	466	126	—	340	485
American Studies and Folklife Program**	8	184	(167)	25	69	—	(44)	83
All Other	137	613	52	802	499	14	289	642
TOTAL FY 1987	\$4,517	\$9,973	\$2,028	\$16,518	\$11,823	\$ 582	\$4,113	\$13,769

*Does not include Government Grants and Contracts

**Miscellaneous and Gifts revenue reflect a prior year adjustment.

Table 5 Unrestricted Trust Funds—General and Auxiliary Activities
Fiscal Years 1986 and 1987 (In \$1,000s)

	FY 1986	FY 1987
FUNDS PROVIDED		
General Income:		
Investments	\$ 4,617	\$ 5,311
Gifts	42	74
Miscellaneous	<u>162</u>	<u>51</u>
Total General Income	4,821	5,436
Auxiliary Activities Income (Net):		
Associates	11,284	16,365
Business Management:		
—Museum Shops and Mail Order	6,076	6,639
—Concessions and Parking	1,720	2,212
—Other	(238)	(164)
Smithsonian Press	1,357	1,734
Traveling Exhibitions*	(566)	—
Photo Services	—	—
Total Auxiliary Activities	19,633	26,786
Total Funds Provided (Net)	24,454	32,222
EXPENDITURES AND TRANSFERS		
Administrative and Program Expense	24,064	21,214
Less Administrative Recovery	<u>11,145</u>	<u>11,849</u>
Net Expense	12,919	9,365
Less Net Transfers Out:		
To Special Purpose for Program Purposes	11,592	16,691
To Plant Funds	37	—
To Endowment Funds	<u>3,000</u>	<u>3,034</u>
Net Transfers Out	14,629	19,725
NET ADDITION TO FUND BALANCE	(3,094)	3,132
ENDING FUND BALANCE	\$ 2,044	\$ 5,176

*Effective with FY 1987 Traveling Exhibitions is classified in the Unrestricted Special Purpose Funds.

Table 6 Auxiliary Activities Fiscal Years 1986 and 1987 (In \$1,000s)

Activity	Sales and membership revenue	Gifts	Less cost of sales	Gross revenue	Expenses	Net revenue* (loss)
FY 1986	<u>\$142,511</u>	<u>\$3,853</u>	<u>\$84,669</u>	<u>\$61,695</u>	<u>\$42,062</u>	<u>\$19,633</u>
FY 1987:						
Associates	\$ 92,004	\$4,477	\$61,031	\$35,450	\$19,085	\$16,365
Business Management:*						
—Museum Shops/Mail Order	43,527	—	23,254	20,273	13,634	6,639
—Concessions/Parking**	3,336	—	—	3,336	1,124	2,212
—Other	576	—	—	576	740	(164)
Smithsonian Press	13,614	—	3,535	10,079	8,345	1,734
Traveling Exhibitions***	—	—	—	—	—	—
Total FY 1987	<u>\$153,057</u>	<u>\$4,477</u>	<u>\$87,820</u>	<u>\$69,714</u>	<u>\$42,928</u>	<u>\$26,786</u>

*Before revenue-sharing transfers to participating Smithsonian bureaus of \$983,000 (FY 1986) and \$1,413,000 (FY 1987).

**Effective FY 1987 Parking was discontinued.

***Effective with FY 1987 Traveling Exhibitions is classified in the Unrestricted Special Purpose Funds.

Table 7 Unrestricted Special Purpose Funds
Fiscal Years 1986 and 1987 (In \$1,000s)

	Revenue				Deductions				Fund balance end of year
	Investment	Bureau activities	Gifts and other revenue	Total revenue	Transfers in (out)	Program expense	Bureau activity expense	Net increase (decrease)	
FY 1986	<u>\$856</u>	<u>\$6,802</u>	<u>\$2,305</u>	<u>\$ 9,963</u>	<u>\$ 8,843</u>	<u>\$13,153</u>	<u>\$4,840</u>	<u>\$ 813</u>	<u>\$24,645</u>
FY 1987:									
Astrophysical Observatory	\$ 53	\$ 318	\$ 66	\$ 437	\$ 1,714	\$ 1,207	\$ 173	\$ 771	\$ 1,950
SAO Computer Center	—	482	—	482	(170)	—	446	(134)	(11)
Tropical Research Institute	—	156	—	156	275	595	161	(325)	332
Environmental Research Center ..	1	22	—	23	125	79	12	57	295
National Zoological Park	290	—	448	738	161	408	—	491	4,237
National Museum of Natural History	84	—	354	438	1,490	1,380	1	547	1,732
National Air and Space Museum	122	3,047	394	3,563	(89)	1,182	1,839	453	2,613
National Museum of American History	31	90	188	309	806	1,025	23	67	1,461
National Museum of American Art	30	62	3,122	3,214	544	2,737	5	1,016	1,979
National Portrait Gallery	6	22	8	36	85	100	20	1	320
Hirshhorn Museum	130	—	11	141	487	329	—	299	858
Center for Asian Art	—	—	—	—	524	27	—	497	501
Cooper-Hewitt Museum	27	1,114	149	1,290	380	731	763	176	838
National Museum of African Art	3	—	2	5	505	1,348	—	(838)	(374)
Traveling Exhibition Service	1	2,122	5	2,128	272	722	1,931	(253)	1,549
Telecommunications	—	40	2	42	—	74	80	(112)	22
SI Computer Center	—	1,243	—	1,243	11	—	1,255	(1)	(1)
Fellowships & Grants	36	—	—	36	2,027	1,930	—	133	1,422
Museum Support Center	—	—	—	—	—	127	—	(127)	81
Reserve for Contingencies	—	—	—	—	3,700	(72)	—	3,772	7,680
Unallocated Programs*	—	—	—	—	2,629	—	—	2,629	3,149
All Other	86	485	740	1,311	1,238	2,170	384	(5)	3,126
TOTAL FY 1987	<u>\$900</u>	<u>\$9,203</u>	<u>\$5,489</u>	<u>\$15,592</u>	<u>\$16,714</u>	<u>\$16,099</u>	<u>\$7,093</u>	<u>\$9,114</u>	<u>\$33,759</u>

*Includes Collection Acquisition, Scholarly Studies, Educational Outreach, and Special Exhibitions Programs.

Table 8 Special Foreign Currency Program
Fiscal Year 1987—Obligations (In \$1,000s)

Country	Archaeology	Systematic & Environmental biology	Astrophysics & earth sciences	Museum programs	Grant Administration	Total
India	\$ —	\$—	\$—	\$—	\$ 12	\$ 12
Pakistan	163	6	—	22	1,000	1,191
Burma	—	—	—	—	—	0
Guinea	2	—	—	—	—	2
Total FY 1987	<u>\$165</u>	<u>\$ 6</u>	<u>\$ 0</u>	<u>\$22</u>	<u>\$1,012</u>	<u>\$1,205</u>

Table 9 Construction and Plant Funds
Fiscal Years 1986 and 1987 (In \$1,000s)

	FY 1986	FY 1987
FUNDS PROVIDED		
Federal Appropriations:		
National Zoological Park	\$ 5,280	\$ 2,500
Restoration and Renovation of Buildings	10,536	12,975
Quadrangle	3,805	3,315
Tupper Research Center	—	2,780
Total Federal Appropriations	<u>19,621</u>	<u>21,570</u>
Nonappropriated Trust Funds:		
Income—Gift and Other		
Smithsonian Environmental Research Center—Gain on Sale	161	4
Smithsonian Tropical Research Institute—Research Facilities	767	2,725
Erection of Jacksonville Bandstand	2	(25)
Cooper-Hewitt Museum	537	410
American Art and Portrait Gallery Building	13	7
Quadrangle and Related	1,125*	643
Smithsonian Institution Building South Entrance	35	—
Visitor Information and Reception Center	—	1,557
National Zoological Park Japanese Crab Exhibit	—	30
Dulles Shelter	—	16
Total Income	<u>2,640</u>	<u>5,367</u>
Transfers from Other Funds:		
National Museum of African Art	19	—
East Garden	50	—
Secretaries' Residence	18	—
Visitor Information and Reception Center	—	(255)**
Dulles Shelter	—	415
Total Transfers	<u>87</u>	<u>160</u>
Total Funds Provided	<u>\$22,348</u>	<u>\$27,097</u>

*In the application of Plant Funds for this project, \$1,000,000 was refunded on a previously collected pledge.

**Funds transferred to Current Funds to cover fund raising expenses.

Table 10 Endowment and Similar Funds September 30, 1987 (In \$1,000s)

	Book Value	Market Value
ASSETS		
Pooled Consolidated Endowment Funds:		
Cash and Equivalents	\$ 30,997	\$31,064
US Govt and Govt Obligations	24,888	23,801
Bonds	4,332	3,987
Convertible Bonds	6,788	7,638
Stocks	132,773	166,261
Total Pooled Funds	<u>199,778</u>	<u>232,751</u>
Nonpooled Endowment Funds:		
Loan to U.S. Treasury in Perpetuity	1,056	1,093
Notes Receivable	40	40
Land, Net	237	237
Total Nonpooled Funds	<u>1,333</u>	<u>1,370</u>
Total Endowment and Similar Fund Balances	<u>\$201,111</u>	<u>\$234,121</u>
FUND BALANCES		
Unrestricted Purpose: True Endowment		
Quasi Endowment	\$ 6,244	\$ 7,898
Quasi Endowment	89,761	101,027
Total Unrestricted Purpose	<u>96,005</u>	<u>108,925</u>
Restricted Purpose: True Endowment		
Quasi Endowment	76,920	92,361
Quasi Endowment	28,186	32,835
Total Restricted Purpose	<u>105,106</u>	<u>125,196</u>
Total Endowment and Similar Fund Balances	<u>\$201,111</u>	<u>\$234,121</u>

Table 11 Market Values of Pooled Consolidated Endowment Funds (In \$1,000s)

Fund	9/30/83	9/30/84	9/30/85	9/30/86	9/30/87
Unrestricted	\$ 54,677	\$ 56,592	\$ 65,404	\$ 81,992	\$107,697
Freer Other	32,096	31,125	34,066	39,570	50,380
Restricted	43,911	43,396	47,830	58,228	74,674
Total	<u>\$130,684</u>	<u>\$131,113</u>	<u>\$147,300</u>	<u>\$179,790</u>	<u>\$232,751</u>

Table 12 Changes in Pooled Consolidated Endowment Funds for Fiscal Year 1987 (In \$1,000s)

Fund	Market value 9/30/86	Gifts and transfers	Interest and dividends*	Income paid out	Subtotal	Market value appreciation	Market value 9/30/87
Unrestricted	\$ 81,992	\$3,340	\$2,948	\$2,949	\$ 85,331	\$22,366	\$107,697
Freer	39,570	—	1,417	1,418	39,569	10,811	50,380
Other Restricted	58,228	500	2,092	2,093	58,727	15,947	74,674
Total	<u>\$179,790</u>	<u>\$3,840</u>	<u>\$6,457</u>	<u>\$6,460</u>	<u>\$183,627</u>	<u>\$49,124</u>	<u>\$232,751</u>

*Income earned, less managers' fees of \$931,116.

Table 13 Endowment Funds September 30, 1987

	Principal		Income	
	Book Value	Market Value	Net Income	Unexpended Balance
UNRESTRICTED PURPOSE—TRUE:				
Avery Fund*	\$211,834	\$272,528	\$8,063	\$0
Higbee, Harry, Memorial	76,573	95,358	3,027	0
Hodgkins Fund*	314,860	354,531	13,238	0
Morrow, Dwight W.	379,730	497,544	14,004	0
Mussinani, Alfred	116,646	145,503	4,095	0
Olmsted, Helen A.	3,945	5,079	143	0
Poore, Lucy T. and George W.*	840,415	1,096,277	31,605	0
Porter, Henry Kirke, Memorial	1,403,543	1,837,250	51,712	0
Sanford, George H.*	5,778	7,176	233	0
Smithson, James*	697,488	723,601	35,576	0
Walcott, Charles D. and Mary Vaux, Research (Designated)	2,193,419	2,863,403	80,594	32,721
Subtotal	6,244,230	7,898,251	242,290	32,721
UNRESTRICTED PURPOSE—QUASI:				
Forrest, Robert Lee	5,093,194	5,536,719	155,838	0
General Endowment*	74,259,569	83,978,329	2,293,131	0
Goddard, Robert H.	40,315	43,847	1,234	0
Habel, Dr. S.*	644	668	33	0
Hart, Gustavus E.	2,701	3,281	92	0
Henry, Caroline	6,679	8,093	228	0
Henry, Joseph and Harriet A.	268,179	323,686	9,110	0
Heys, Maude C.	490,595	538,752	15,164	0
Hinton, Carrie Susan	134,946	157,603	4,436	0
Lambert, Paula C.	244,364	289,142	8,138	0
Medinus, Grace L.	4,864	5,363	151	0
Rhees, William Jones*	3,356	3,927	127	0
Safford, Clara Louise	225,511	251,646	7,083	0
Smithsonian Bequest Fund*	1,482,426	1,574,506	34,899	0
Taggart, Ganson	2,364	3,066	86	0
Abbott, William L. (Designated)	628,732	760,837	21,415	65,798
Barstow, Frederic D. (Designated)	5,261	6,359	179	6,445
Hirshhorn Museum Acquisition Fund (Designated)	3,333,171	3,697,776	104,079	157,759
Lindbergh Chair of Aerospace History (Designated)	2,348,307	2,635,112	74,169	102,808
Lindbergh, Charles A. (Designated)	38,501	42,425	840	12,621
Lyon, Marcus Ward, Jr. (Designated)	20,292	22,672	638	4,459
Smithsonian Agency Account (Designated)	29,943	31,579	659	0
Webb, James E., Fellowship (Designated)	1,097,052	1,111,543	31,286	69,478
Subtotal	89,760,966	101,026,931	2,763,014	419,367
Total Unrestricted Purpose	\$ 96,005,196	\$108,925,182	\$3,005,304	\$ 452,088

Table 13 Endowment Funds September 30, 1987 (Continued)

	Principal		Income	
	Book Value	Market Value	Net Income	Unexpended Balance
RESTRICTED PURPOSE—TRUE:				
Arthur, James	189,056	249,204	7,014	9,469
Baird, Spence Fullerton	170,495	222,763	6,270	3,619
Barney, Alice Pike, Memorial	135,514	178,581	5,026	32,080
Batchelor, Emma E.	161,230	184,723	5,199	94,759
Beauregard, Catherine, memorial	206,375	249,551	7,024	61,174
Bergen, Charlotte V.	17,165	18,443	519	1,812
Brown, Roland W.	139,859	171,269	4,821	18,739
Canfield, Frederick A.	198,763	274,566	7,728	308
Casey, Thomas Lincoln	66,123	80,006	2,252	3,268
Chamberlain, Frances Lea	133,056	175,344	4,935	26,068
Cooper Fund for Paleobiology	143,527	156,653	4,299	0
Division of Mammals Curators Fund	9,530	11,213	315	5,406
Drake Foundation	858,502	996,751	27,944	139,145
Drouet, Francis and Louderback, Harold B. Fund	275,760	297,783	8,382	32,903
Dykes, Charles, Bequest	254,906	303,192	8,534	21,929
Eickemeyer, Florence Brevoort	51,346	67,655	1,904	16,281
Forbes, Edward Waldo	514,122	534,337	15,040	26,912
Freer, Charles L.	41,703,675	50,379,611	1,417,999	1,348,336
Grimm, Sergei, N.	144,991	157,843	4,443	28,264
Groom, Barrick W.	148,050	158,890	4,472	14,240
Guggenheim, Daniel and Florence	572,942	644,615	18,144	61,649
Hamilton, James*	5,216	6,037	240	2,427
Henderson, Edward P., Meteorite Fund	114,775	111,371	2,111	336
Hewitt, Eleanor G., Repair Fund	34,915	40,528	1,141	1,029
Hewitt, Sarah Cooper	206,331	239,220	6,733	8,185
Hillyer, Virgil	34,674	41,956	1,181	14,636
Hitchcock, Albert S.	7,534	9,983	281	132
Hodgkins Fund*	128,732	133,554	6,568	12,865
Hrdlicka, Ales and Marie	253,341	310,249	8,732	12,582
Hughes, Bruce	90,509	119,324	3,359	14,087
Johnson, Seward, Trust Fund for Oceanography	17,284,656	20,953,626	589,767	149,285
Kellogg, Remington, Memorial	116,751	129,233	3,637	12,426
Kramar, Nada	13,755	16,310	459	4,659
Maxwell, Mary E.	92,739	122,258	3,441	40,883
Milliken, H. Oothout, Memorial	1,028	1,191	33	114
Mineral Endowment	469,414	549,064	15,454	76
Mitchell, William A.	64,036	75,111	2,114	4,914
Nelms, Henning Endowment Fund	199,869	194,150	455	455
Nelson, Edward William	107,626	138,447	3,897	0
Petrocelli, Joseph, Memorial	35,133	46,374	1,305	19,244
Reid, Addison T.*	107,951	128,152	3,976	9,074
Ripley, S. Dillon and Mary Livingston	139,329	156,537	4,296	0
Roebing Fund	568,621	747,882	21,050	322
Rollins, Miriam and William	1,121,689	1,380,698	38,554	4,681
Sims, George W.	107,303	114,337	3,218	4,414
Sprague Fund	7,131,608	8,256,114	230,543	40,006
Springer, Frank	84,978	111,601	3,141	27,281
Stern, Harold P., Memorial	881,175	1,013,147	28,386	132,564
Stevenson, John A., Mycological Library	25,291	30,490	858	2,770
Stuart, Mary Horner	372,736	387,392	10,904	6,004
Walcott, Charles D. and Mary Vaux, Research	724,935	879,109	24,500	19,026
Walcott Research Fund, Botanical Publications	274,939	377,474	10,624	9,053
Williston, Samuel Wendell Diptera Research	18,460	20,568	576	3,083
Zerbee, Frances Brinckle	4,465	5,868	165	6,298
Subtotal	76,919,500	92,360,346	2,593,966	2,509,375

Table 13 Endowment Funds September 30, 1987 (Continued)

	Principal		Income	
	Book Value	Market Value	Net Income	Unexpended Balance
RESTRICTED PURPOSE—QUASI:				
Armstrong, Edwin James	17,137	19,539	541	-0-
Au Pamer Fleurt	94,775	103,265	2,907	1,732
Bacon, Virginia Purdy	448,080	518,295	14,588	56,191
Becker, George F.	773,212	897,072	25,249	16,335
Desautels, Paul E.	54,273	65,711	1,842	-0-
Gaver, Gordon	6,144	7,295	205	3,790
Hachenberg, George P. and Caroline	22,052	27,268	767	3,910
Hanson, Martin Gustav and Caroline R.	46,880	56,713	1,596	10,101
Hirshhorn Collections Endowment Fund	2,680,538	2,686,530	68,636	76,532
Hunterdon Endowment	15,568,243	18,635,132	524,510	278,747
ICBP Endowment	951,079	1,049,857	29,336	27,139
ICBP Conservation Endowment	207,030	226,436	6,352	8,469
Johnson, E. R. Fenimore	37,686	41,990	1,182	5,241
Loeb, Morris	463,281	562,463	15,831	67,981
Long, Annette E. and Edith C.	2,612	3,474	98	593
Myer, Catherine Walden	106,554	128,908	3,628	22,452
Noyes, Frank B.	5,276	6,497	183	3,529
Noyes, Pauline Riggs	44,641	48,661	1,370	2,353
Pell, Cornelia Livingston	39,261	47,589	1,339	5,999
Ramsey, Adm. and Mrs. Dewitt Clinton*	983,418	1,179,736	39,900	18,988
Rathbun, Richard, Memorial	56,278	68,187	1,919	19,614
Roebing Solar Research	124,620	146,603	4,126	18,665
Ruef, Bertha M.	146,912	163,637	4,606	6,201
Schultz, Leonard P.	59,215	68,653	1,845	28,730
Seidell, Atherton	3,062,908	3,544,169	99,755	333,945
Smithsonian Agency Account	1,451,189	1,645,341	47,478	64
Strong, Julia D.	52,890	64,074	1,803	4,752
Witherspoon, Thomas A., Memorial	679,885	822,146	23,140	81,337
Subtotal	28,186,069	32,835,241	924,736	1,103,390
Total Restricted Purpose	<u>\$105,105,569</u>	<u>\$125,195,587</u>	<u>\$3,518,702</u>	<u>\$3,612,765</u>
TOTAL ENDOWMENT FUNDS	<u>\$201,110,765</u>	<u>\$234,120,769</u>	<u>\$6,524,006**</u>	<u>\$4,064,853</u>

*Invested all or in part in U.S. Treasury or other nonpooled investments.

**Total Return Income Payout; does not include \$278,384 of interest income.

Coopers & Lybrand
Certified Public Accountants

To the Board of Regents
Smithsonian Institution

We have examined the statement of financial condition of the Smithsonian Institution—Trust Funds as of September 30, 1987, and the related statement of financial activity for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the statements of the Smithsonian Institution—Trust Funds for the year ended September 30, 1986, totals of which are included in the accompanying financial statements for comparative purposes only.

In our opinion, the financial statements referred to above, present fairly the financial position of the Smithsonian Institution—Trust Funds as of September 30, 1987, and the results of its operations and changes in its fund balances for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

1800 M Street, N. W.
Washington, D. C. 20036
December 31, 1987

Smithsonian Institution Statement of Financial Condition
September 30, 1987 (with comparative totals for September 30, 1986)
(thousands of dollars)

	Trust funds	Federal funds	Totals, all funds	Totals, 1986
ASSETS:				
Fund balances with U. S.				
Treasury and cash on hand	\$ 3,244	\$ 83,328	\$ 86,572	\$ 79,433
Investments (Notes 1, 3 and 16)	278,201	—	278,201	220,190
Receivables (Note 5)	35,206	8,393	43,599	43,969
Advance payments (Note 6)	360	18,341	18,701	15,605
Merchandise inventory (Note 1)	12,001	—	12,001	11,140
Materials and supplies inventory (Note 1)	—	1,412	1,412	1,421
Prepaid, deferred expense and other (Note 1)	13,911	—	13,911	13,952
Property and equipment (Notes 1 and 7)	56,194	221,629	277,823	258,097
Total assets	<u>\$399,117</u>	<u>\$333,103</u>	<u>\$732,220</u>	<u>\$643,807</u>
LIABILITIES:				
Accounts payable and accrued expenses, including interfund payable of \$15,340,000	\$ 32,396	\$ 17,609	\$ 50,005	\$ 52,139
Deposits held in custody for other organizations (Note 2)	4,395	41	4,436	4,099
Accrued annual leave (Note 1)	2,182	8,199	10,381	9,736
Deferred revenue (Note 1)	33,625	—	33,625	30,999
Long-term debt (Note 8)	13,812	—	13,812	3,748
Total liabilities	<u>86,410</u>	<u>25,849</u>	<u>112,259</u>	<u>100,721</u>
Undelivered orders (Note 1)	—	67,277	67,277	59,368
FUND BALANCES (Note 1):				
Trust funds:				
Current:				
Unrestricted general purpose	5,176	—	5,176	2,044
Special purpose	33,759	—	33,759	24,645
Restricted	13,769	—	13,769	9,656
Endowment and similar funds (Note 4)	201,111	—	201,111	161,997
Plant funds (Note 7)	58,892	—	58,892	53,007
Total trust fund balances	<u>312,707</u>	<u>—</u>	<u>312,707</u>	<u>251,349</u>
Federal funds:				
Operating funds — restricted (Note 9)	—	388	388	2,316
Construction funds	—	16,547	16,547	15,952
Capital funds	—	223,042	223,042	214,101
Total federal fund balances	<u>—</u>	<u>239,977</u>	<u>239,977</u>	<u>232,369</u>
Total fund balances	<u>312,707</u>	<u>239,977</u>	<u>552,684</u>	<u>483,718</u>
Total liabilities, undelivered orders and fund balances	<u>\$399,117</u>	<u>\$333,103</u>	<u>\$732,220</u>	<u>\$643,807</u>

The accompanying notes are an integral part of these financial statements.

Smithsonian Institution Statement of Financial Activity for the year ended September 30, 1987
(with comparative totals for the year ended September 30, 1986) (thousands of dollars)

	Trust funds				Totals, federal funds
	Totals, trust funds	Current funds	Endowment and similar funds	Plant funds	
REVENUE AND OTHER ADDITIONS:					
Appropriations	\$ —	\$ —	\$ —	\$ —	\$210,544
Auxiliary activities revenue	161,740	161,740	—	—	—
Government grants and contracts	15,873	15,873	—	—	—
Investment income	12,491	11,278	—	1,213	—
Net gain on sale of securities and property	35,315	—	35,315	—	—
Gifts, bequests and foundation grants	19,330	14,841	336	4,153	—
Additions to plant	8,088	—	—	8,088	27,837
Rentals, fees, commissions and other	8,000	8,000	—	—	1,728
Total revenue and other additions	<u>260,837</u>	<u>211,732</u>	<u>35,651</u>	<u>13,454</u>	<u>240,109</u>
EXPENDITURES AND OTHER DEDUCTIONS:					
Research, educational, and collection acquisition expenditures (Note 10)	45,707	45,707	—	—	121,070
Administrative expenditures	12,878	12,878	—	—	15,789
Facilities services expenditures	2,072	2,072	—	—	55,428
Auxiliary activities expenditures	131,093	131,093	—	—	—
Acquisition of plant and other	6,556	—	—	6,556	20,975
Property use and retirements (Note 7)	1,173	—	—	1,173	18,896
Retirement of and interest on indebtedness	—	—	—	—	—
Total expenditures and other deductions	<u>199,479</u>	<u>191,750</u>	<u>—</u>	<u>7,729</u>	<u>232,158</u>
Excess of revenue and other additions over expenditures and other deductions	<u>61,358</u>	<u>19,982</u>	<u>35,651</u>	<u>5,725</u>	<u>7,951</u>
TRANSFERS AMONG FUNDS— ADDITIONS (DEDUCTIONS) (Note 11)					
Net increase (decrease) for the year	—	(3,623)	3,463	160	—
Returned to U. S. Treasury	61,358	16,359	39,114	5,885	7,951
Fund balances at beginning of year ...	—	—	—	—	(343)
Fund balances at end of year (Note 9)	<u>251,349</u>	<u>36,345</u>	<u>161,997</u>	<u>53,007</u>	<u>232,369</u>
Fund balances at end of year (Note 9)	<u>\$312,707</u>	<u>\$ 52,704</u>	<u>\$201,111</u>	<u>\$ 58,892</u>	<u>\$239,977</u>

The accompanying notes are an integral part of these financial statements.

Federal Funds

Operating funds	Construction funds	Capital funds	Totals, all funds	Totals, 1986
\$188,974	\$21,570	\$ —	\$210,544	\$191,383
—	—	—	161,740	149,313
—	—	—	15,873	15,534
—	—	—	12,491	11,988
—	—	—	35,315	15,478
—	—	—	19,330	11,707
—	—	27,837	35,925	40,538
1,728	—	—	9,728	7,481
<u>190,702</u>	<u>21,570</u>	<u>27,837</u>	<u>500,946</u>	<u>443,422</u>
121,070	—	—	166,777	154,467
15,789	—	—	28,667	24,619
55,428	—	—	57,500	51,500
—	—	—	131,093	125,381
—	20,975	—	27,531	30,465
—	—	18,896	20,069	18,400
—	—	—	—	167
<u>192,287</u>	<u>20,975</u>	<u>18,896</u>	<u>431,637</u>	<u>404,999</u>
<u>(1,585)</u>	<u>595</u>	<u>8,941</u>	<u>69,309</u>	<u>38,423</u>
—	—	—	—	—
(1,585)	595	8,941	69,309	38,423
(343)	—	—	(343)	(185)
<u>2,316</u>	<u>15,952</u>	<u>214,101</u>	<u>483,718</u>	<u>445,480</u>
<u>\$ 388</u>	<u>\$ 16,547</u>	<u>\$223,042</u>	<u>\$552,684</u>	<u>\$483,718</u>

Smithsonian Institution Notes to Financial Statements

1. Summary of significant accounting policies

Basis of Presentation

The financial statements do not include the accounts of the National Gallery of Art, the John F. Kennedy Center for the Performing Arts or the Woodrow Wilson International Center for Scholars, which were established by Congress within the Smithsonian Institution (the Institution) but are administered under separate boards of trustees.

The financial statements of the Institution with respect to Federal Appropriations have been prepared on the obligation basis of accounting, which is in accordance with accounting principles prescribed by the Comptroller General of the United States as set forth in the *Policy and Procedures Manual for Guidance of Federal Agencies*. The obligation basis of accounting differs in some respects from generally accepted accounting principles. Under this method of accounting, approximately \$51,427,000 of commitments of the operating fund, such as purchase orders and contracts, have been recognized as expenditures, and the related obligations have been reported on the Statement of Financial Condition at September 30, 1987 even though the goods and services have not been received. Approximately \$13,000,000 of these commitments are for grants under the foreign currency program. Approximately \$15,500,000 of these commitments are for internal storage facilities and equipment at the Museum Support Center. In addition, construction fund commitments for other projects amounted to approximately \$15,850,000 at September 30, 1987.

The trust funds reflect the receipt and expenditure of funds obtained from private sources, federal grants and contracts, investment income and certain business activities related to the operations of the Institution.

Fund Accounting

To ensure observance of the limitations and restrictions placed on the use of resources available to the Institution, accounts are maintained in accordance with the principles of fund accounting. This procedure classifies resources for control, accounting and reporting purposes into distinct funds established according to their appropriation, nature and purposes. Funds that have similar characteristics have been combined into fund groups in the accompanying financial statements. Accordingly, all financial

transactions have been recorded and reported by fund group.

The assets, liabilities and fund balances of the Institution are self-balancing as follows:

Federal operating funds represent the portion of expendable funds available for support of Institution operations.

Federal construction funds represent that portion of expendable funds available for building and facility construction, restoration, renovation and repair. Separate subfund groups are maintained for each appropriation—Construction and Improvements, National Zoological Park, Restoration and Renovation of Buildings, Museum Support Center and the Center for African, Near Eastern, and Asian Cultures (Quadrangle).

Federal capital funds represent the value of those assets of the Institution acquired with federal funds and nonexpendable property transfers from government agencies.

Trust current funds, which include unrestricted and restricted resources, represent the portion of expendable funds that is available for support of Institution operations. Amounts restricted by the donor for specific purposes are segregated from other current funds.

Trust endowment and similar funds include funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and the income only be used. Also classified as endowment and similar funds are gifts which allow the expenditure of principal but only under certain specified conditions. Quasi-endowment funds are funds established by the governing board for the same purposes as endowment funds; however, any portion of such funds may be expended. Restricted quasi-endowment funds represent gifts for restricted purposes where there is no stipulation that the principal be maintained in perpetuity or for a period of time, but the governing board has elected to invest the principal and expend only the income for the purpose stipulated by the donor.

Trust plant funds represent resources restricted for future plant acquisitions and funds expended for plant.

Investments

All gains and losses arising from the sale, collection or other disposition of investments and property are accounted for in the fund in which the related assets are

recorded. Income from investments is accounted for in a similar manner, except for income derived from investments of endowment and similar funds, which is accounted for in the fund to which it is restricted or, if unrestricted, as revenue in unrestricted current funds. Gains and losses on the sale of investments are recognized on the trade date basis using the average cost method.

Inventory

Inventories are carried at the lower of cost or market. Cost is determined using the first-in, first-out (FIFO) method or retail cost method (for those inventories held for resale).

Deferred Revenue and Expense

Revenue from subscriptions to *Smithsonian Magazine* is recorded as income over the period of the related subscription, which is generally one year. Costs related to obtaining subscriptions to *Smithsonian Magazine* are charged against income over the period of the subscription.

The Institution recognizes revenue and charges expenses of other auxiliary activities during the period in which the activity is conducted.

Works of Art, Living or Other Specimens

The Institution acquires its collections, which include works of art, library books, photographic archives, objects and specimens, through purchase by federal or private funds or by donation. In accordance with policies generally followed by museums, no value is assigned to the collections on the statement of financial condition. Purchases for the collections are expensed currently.

Property and Equipment

Nonexpendable equipment purchased with federal funds is recorded at cost and is depreciated on a straight-line basis over a period of 10 years. Equipment purchased with trust funds for use by nonincome-producing activities is treated as a deduction of the current fund and as a capitalized cost of the plant fund. Depreciation on equip-

ment capitalized in the plant fund is recorded on a straight-line basis over the estimated useful life of 10 years (see Note 7). Capital improvements and equipment purchased with trust funds and utilized in income-producing activities are capitalized at cost and are depreciated on a straight-line basis over their estimated useful lives of 3 to 10 years.

Buildings and other structures, additions to buildings and fixed equipment purchased with federal funds are recorded in the capital funds at cost and depreciated on a straight-line basis over a period of 30 years. Costs associated with renovating, restoring and improving structures are depreciated over their useful lives of 15 years.

Certain lands occupied by the Institution's buildings were appropriated and reserved by Congress for the Smithsonian and are not reflected in the accompanying financial statements. Property and nonexpendable equipment acquired through transfer from government agencies are capitalized at the transfer price or at estimated amounts, taking into consideration usefulness, condition and market value.

Real estate (land and buildings) purchased with trust funds is recorded at cost, to the extent that restricted or unrestricted funds were expended therefor, or appraised value at date of gift, except for gifts of certain islands in the Chesapeake Bay and the Carnegie Mansion, which have been recorded at nominal values. Costs of original building structures and major additions are depreciated on a straight-line basis over their estimated useful lives of 30 years. Costs of renovating, restoring and improving structures are depreciated on a straight-line basis over their estimated useful lives of 15 years. Depreciation is recorded in the plant funds as a deduction to the investment in plant (see Note 7).

Government Grants and Contracts

The Institution has a number of grants and contracts with the U.S. Government, which primarily provide for cost reimbursement to the Institution. Grant and contract revenue is recognized as expenditures are incurred within trust funds.

Pledges and Donations

The Institution records significant pledges that are supported by letters signed by donors. Pledges are recorded at net realizable value as a receivable and as deferred

revenue on the statement of financial condition. Revenue from pledges is recognized in the year the pledge funds are collected.

Donations are recognized as revenue in the year the cash is received.

Contributed Services

A substantial number of unpaid volunteers have made significant contributions of their time in the furtherance of the Institution's programs. The value of this contributed time is not reflected in these statements in accordance with generally accepted accounting principles.

Annual Leave

The Institution's civil service employees earn annual leave in accordance with federal law and regulations. However, only the cost of leave taken as salaries is funded and recorded as an expense. The cost of unused annual leave at year-end is reflected in the accompanying financial statements as an asset and accrued liability in the federal funds.

Annual leave is recorded for trust employees in the trust fund as earned.

2. Related Activities

The Institution provides fiscal and administrative services to several, separately incorporated organizations in which certain officials of the Institution serve on the governing boards. The amounts paid to the Institution by these organizations for the aforementioned services, together with rent for Institution facilities occupied, etc., totaled approximately \$351,000 (\$276,000 for the trust funds and \$75,000 for the federal funds) for the year ended September 30, 1987. Deposits held in custody for these organizations are approximately \$4,395,000 as of September 30, 1987.

The following summarizes the approximate expenditures of these organizations for the fiscal year ended September 30, 1987 as reflected in their individual financial statements, which are not included in the accompanying financial statements of the Institution:

Reading Is Fundamental, Inc.	\$6,635,000
Woodrow Wilson International Center for Scholars:	
Trust funds	\$5,186,000
Federal appropriations	\$3,362,000

3. Investments

Investments are recorded at cost on a trade date basis, if purchased, or estimated fair market value at date of acquisition, if acquired by gift. At September 30, 1987, investments were composed of the following:

	Carrying value (\$000s)	Market value (\$000s)
Current funds:		
Short-term cash equivalents	\$ 52,008	\$ 52,008
U. S. Government and quasi-government obligations	26,151	26,325
Common and preferred stock	<u>108</u>	<u>106</u>
	<u>78,267</u>	<u>78,439</u>
Endowment and similar funds:		
Short-term cash equivalents	23,125	23,125
Deposit with U. S. Treasury	1,055	1,093
U. S. Government and quasi-government obligations	31,708	30,672
Corporate bonds	11,120	11,625
Common and preferred stock	<u>132,774</u>	<u>166,261</u>
	<u>199,782</u>	<u>232,776</u>
Plant funds:		
U. S. Government and quasi-government obligations	27	27
Common stock	<u>125</u>	<u>125</u>
	<u>152</u>	<u>152</u>
Total investments	<u>\$278,201</u>	<u>\$311,367</u>

Since October 1, 1982, the deposit with the U. S. Treasury has been invested in U.S. Government securities at a variable yield based on market rates.

Substantially all the investments of the endowment and similar funds are pooled on a market value basis (consolidated fund) with each individual fund subscribing to or disposing of units on the basis of the per unit market value at the beginning of the month within which the

transaction takes place. The unit value as of September 30, 1987 was \$330.06; 301,067 units were owned by endowment, and 404,107 units were owned by quasi-endowment at September 30, 1987.

The following tabulation summarizes changes in relationships between cost and market values of the pooled investments (including adjustments for nonpooled investments such as the deposit with the U.S. Treasury, land held for investment and notes receivable of the endowment fund and pooled assets such as interfund receivables):

	(\$000s)			Market value per unit
	Market	Cost	Net change	
End of year	\$232,751	\$199,778	\$ 32,973	\$330.06
Beginning of year	\$179,790	\$160,626	<u>19,164</u>	259.24
Increase in unrealized net gain for the year			13,809	—
Realized net gain for the year			<u>35,315</u>	—
Net Change			<u>\$ 49,124</u>	<u>\$ 70.82</u>

4. Endowment and Similar Funds

The fund balances for the endowment and similar funds at September 30, 1987 are summarized as follows:

	(\$000s)
Endowment funds, income available for:	
Restricted purposes	\$ 76,920
Unrestricted purposes	<u>6,244</u>
	<u>83,164</u>
Quasi-endowment funds, principal and income available for:	
Restricted purposes	28,186
Unrestricted purposes	<u>89,761</u>
	<u>117,947</u>
Total endowment and similar funds	<u>\$201,111</u>

The Institution utilizes the "total return" approach to investment management of endowment funds and quasi-

endowment funds. Under this approach, the total investment return is considered to include realized and unrealized gains and losses in addition to interest and dividends. An amount equal to the difference between interest and dividends earned during the year and the amount computed under the total return formula is transferred to or from the current funds.

In applying this approach, it is the Institution's policy to provide, as being available for current expenditures, an amount taking into consideration such factors as, but not limited to: (1) 4½% of the five-year average of the market value of each fund (adjusted for gifts and transfers during this period), (2) current dividend and interest yield, (3) support needs for bureaus and scientists, and (4) inflationary factors as measured by the Consumer Price Index; however, where the market value of the assets of any endowment fund is less than 110% of the historic dollar value (value of gifts at date of donation), the amount provided is limited to only interest and dividends received.

The total return factor for 1987 was 5% or \$9.29 per unit to all participating funds. The total return applied for 1987 was \$3,511,000 to Restricted Funds and \$2,949,000 to Unrestricted Funds.

5. Receivables

Receivables at September 30, 1987 included the following:

	(\$000s)
<i>Federal funds</i>	
Amount to be provided for accrued annual leave	\$ 8,199
Service fees and charges	<u>194</u>
	<u>8,393</u>
<i>Trust funds</i>	
Accounts receivable, auxiliary activities, net	11,470
Interfund receivables due from current funds:	
Endowment and similar funds	1,050
Plant funds	14,290
Interest and dividends receivable	2,772
Billed and unbilled costs and fees from grants and contracts	4,739
Pledges	845
Other	<u>40</u>
	<u>35,206</u>
Total, all funds	<u>\$43,599</u>

6. Advance Payments

Advance payments represent prepayments made to government agencies, educational institutions, firms and individuals for services to be rendered, or property or materials to be furnished.

As of September 30, 1987, the Institution had advances outstanding to the General Services Administration of approximately \$15,181,000, principally for construction services including the Museum Support Center and other projects to be completed in future fiscal years. The Institution at that date also had advances outstanding to educational institutions amounting to approximately \$2,565,000, principally under the Special Foreign Currency Program.

7. Property and Equipment

At September 30, 1987, property and equipment were comprised of the following:

	<u>(\$000s)</u>	<u>(\$000s)</u>
<i>Federal</i>		
<i>Capital funds</i>		
Property	\$329,272	
Equipment	37,487	
Less accumulated depreciation	<u>(145,130)</u>	
Total, federal funds		<u>\$221,629</u>
<i>Trust</i>		
<i>Current funds</i>		
Capital improvements	9,343	
Equipment	7,258	
Leasehold improvements	1,558	
Less accumulated depreciation and amortization	<u>(7,372)</u>	
	<u>10,787</u>	
<i>Endowment and similar funds</i>		
Land	<u>240</u>	
<i>Plant funds</i>		
Land and buildings	48,517	
Equipment	5,515	
Less accumulated depreciation	<u>(8,865)</u>	
	<u>45,167</u>	
Total, trust funds		<u>\$ 56,194</u>
Total, all funds		<u>\$277,823</u>

Included in the accumulated depreciation of the federal capital funds is approximately \$15,568,000 of depreciation expense for 1987.

Trust funds' depreciation and amortization expense for fiscal year 1987 for income-producing assets amounted to approximately \$1,873,000 which is included in auxiliary activities expenditures in the current funds. Depreciation of nonincome-producing equipment and buildings for 1987 amounted to approximately \$1,173,000.

The balance of the plant fund at September 30, 1987 included approximately \$13,725,000 of unexpended trust plant funds.

8. Long-term Debt

Long-term debt as of September 30, 1987 consists of the following:

	<u>(\$000s)</u>
9% note payable to Riggs National Bank, interest only payable quarterly commencing December 31, 1986, interest and principal payable quarterly commencing September 30, 1991 and ending on June 30, 1998	\$11,000
Noninterest-bearing note payable for the purchase of art, due in four annual installments commencing January 9, 1986 and ending January 10, 1989, security interest in the art purchased retained by the lender	\$ 2,000
Noninterest-bearing note payable for purchase of food service equipment, due monthly commencing September 18, 1987 through July 21, 1990	412
9% note payable for purchase of Folkways Records and Service Corporation, due in four annual installments commencing December 31, 1987	400
	<u>\$13,812</u>

The aggregate amount of maturities for all borrowings for the years ending September 30, are as follows: \$1,750,000 in 1988; \$750,000 in 1989; \$212,000 in 1990; \$386,000 in 1991; \$1,211,000 in 1992; and \$9,503,000 in years thereafter.

The proceeds of the note with Riggs National Bank are being used to fund construction of a restaurant addition

to the National Air and Space Museum. Interest on the note was approximately \$806,000 for fiscal year 1987 of which \$654,000 was recorded as interest expense of the Auxiliary Activities funds and \$152,000 was capitalized as a cost of the restaurant.

9. Federal Operating Funds

The federal operating funds include appropriations for salaries and expenses which are expended in the year received. Also included are amounts received with the provision that such amounts can be expended over a period greater than one year.

The federal operating funds for the year ended September 30, 1987 included the following:

	Additions (\$000s)		Fund Balance at Sept. 30, 1987
	Appropriations	Other	
Salaries and expenses	\$188,974	\$ —	\$ —
Special Foreign Currency Program	—	—	173
U.S. India Fund (transfers from Department of State)	—	1,585	141
Smithsonian Tropical Research Institute	—	143	74
	<u>\$188,974</u>	<u>\$1,728</u>	<u>\$388</u>

10. Collection Acquisitions

In keeping with accounting principles, the Institution records the acquisition of collections as an expense in the year of purchase. For fiscal year 1987, \$5,218,000 was expensed to Trust funds and \$1,528,000 to federal funds for the acquisition of collections.

11. Transfers Among Funds

The following transfers among trust funds were made for the year ended September 30, 1987 in thousands of dollars:

	Current funds		Endowment and similar funds	Plant funds
	Unrestricted	Restricted		
Portion of investment yield appropriated	\$ (28)	\$ (2)	\$ 30	\$ —
Income added to endowment principal	(1)	(181)	182	—
For special purposes	267	(12)		(255)
Endowment released	—	65	(480)	415
Appropriated as quasi-endowment	(3,278)	(453)	3,731	—
Total transfers among funds	<u>\$ (3,040)</u>	<u>\$ (583)</u>	<u>\$ 3,463</u>	<u>\$ 160</u>

12. Retirement Plans

The federal employees of the Institution are covered by either the Civil Service Retirement System (CSRS) or the Federal Employee Retirement System (FERS). The features of both of these systems are defined in published government documents. Under both systems, the Institution withholds from the salary of each federal employee the percentage of salary specified by each program, and the Institution contributes specified percentages. The cost of the programs for the year ended September 30, 1987 was approximately \$7,774,000.

The Institution has a separate retirement plan for trust employees. Under the plan, both the Institution and the employees contribute stipulated percentages of salary which are used to purchase individual annuities, the rights to which are immediately vested with the employees. The cost of the plan for the year ended September 30, 1987 was \$4,092,000.

It is the policy of the Institution to fund the accrued costs of the plans currently. There are no unfunded prior service costs under the plans.

13. Income Taxes

The Institution is exempt from income taxation under the provisions of Section 501(c)(3) of the Internal Revenue Code. Organizations described in that section are taxable only on their unrelated business income. No provision for income taxes is required for the year ended September 30, 1987 since the Institution had a net loss from unrelated business activity.

It is the opinion of the Institution that it is also exempt from taxation as an instrumentality of the United States as defined in Section 501(c)(1) of the Code. Organizations described in that section are exempt from all income taxation. The Institution has not as yet formally sought such dual status.

14. Reclassifications

Certain reclassifications were made to previously reported 1986 amounts to conform with the 1987 presentation.

15. Commitments

Contractual commitments of Trust funds as of September 30, 1987 were approximately \$14,000,000 in excess of costs incurred. The commitments pertain to construction and major maintenance projects.

16. Subsequent Event

The stock market declined significantly in October 1987. The market value of the Institution's investments in endowment and similar funds declined approximately \$44,000,000 or 19% from September 30, 1987 to December 31, 1987. The Dow Jones Industrial Average declined 25% for the same period.

RESEARCH

David Challinor, Assistant Secretary for Research

The correspondence and private papers of Joseph Henry (1797–1878) thoroughly document his roles as a leader of the nineteenth-century American scientific community and as the first Secretary of the Smithsonian Institution (1846–1878). Under the joint sponsorship of the Smithsonian, the National Academy of Sciences, and the American Philosophical Society, the Joseph Henry Papers project is preparing a selective edition of these important records. When completed, the series will comprise fifteen volumes. The first five volumes, tracing Henry's early years in Albany and his career as professor of natural philosophy at the College of New Jersey (now Princeton University), have received favorable reviews and praise from scholars studying the growth of American science and society.

During 1987, the project staff neared completion of the sixth volume, which will cover 1844–1846 and will trace the events leading to Henry's selection as Secretary of the Smithsonian Institution. New office automation equipment installed in the past year provides flexibility and reduces the time the staff needs to review, edit, and revise documents for publication. An able corps of volunteers began a long-term project to transcribe Henry's daily desk diaries. Spanning 1849 to 1876, these diaries contain intimate and revealing insights into Henry's work as Secretary as he guided the Smithsonian through its first three decades.

The project continued its education outreach and cooperative activities. Three summer interns received instruction in documentary editing techniques while they conducted research on various topics relating to Henry and the Smithsonian. Scholars from the United States, Australia, and the Federal Republic of Germany participated in the Nineteenth-Century Seminar, sponsored by the project, discussing topics in scientific, intellectual, cultural, social, and technological history.

Dr. Paul Theerman, an assistant editor with the project, served as guest curator for the exhibition "Isaac Newton and the *Principia*: Three Hundred Years," which opened in March at the National Museum of American History. In connection with the exhibition, Theerman also organized a symposium at the University of Maryland to examine Newton's impact on the development of science, society, and culture.

The National Zoological Park (NZP) is evolving rapidly into a biological park, stressing the diversity and interdependence of plants and animals. New exhibits do away with the unnatural separation of plants and animals that characterizes most zoos, broaden appreciation for the animal kingdom's lesser-known members, and underscore the ecological and evolutionary relationships among organisms.

These aims are embodied in the zoo's Invertebrate Exhibit, which opened in 1987 at NZP's 163-acre Rock Creek facility in Washington, D.C. For many visitors, the novel exhibit is their introduction to cuttlefish, amoebas, sponges, and other interesting representatives of the more than 95 percent of animal species that do not have backbones.

Also in 1987, studies at Rock Creek and the 3,000-acre Conservation and Research Center in Front Royal, Virginia, furthered NZP's efforts to advance understanding in the biological and veterinary sciences and to preserve the Earth's natural diversity. These on-site activities were complemented by work done cooperatively with other zoos and research organizations in the United States and other nations.

Animal Exhibits

Animal exhibits are the NZP's primary means of educating the general public about animal welfare and behavior, about biological principles and relationships, and about the role of humans within the natural world. The exhibits at Rock Creek appeal to both serious-minded zoogoers and to visitors on recreational outings.

The opening of the Invertebrate Exhibit in 1987 marked a major step toward transforming the National Zoo into a biological park. Complementing quality exhibits of vertebrate animals—birds, mammals, reptiles, and amphibians—the new three-hall display gives long-overdue attention to the members of the animal kingdom that play key roles in maintaining the balance of life on Earth. The broad assortment includes specimens of marine invertebrates such as corals, octopuses, sea worms, and nautilus. Among the terrestrial representatives are leaf-cutter ants, orb-web spiders, and stick insects. Accompanying graphics and displays foster understanding

In July, a female calf was born to the National Zoo's Massai giraffes. The birth occurred in midmorning, in full view of many early visitors.



of biological processes, explaining adaptation, communication, ecology, speciation, and relationships between predator and prey. A series of 65-gallon aquariums allow interested visitors to study invertebrate adaptation. Flashlights, hand lenses, and microscopes are provided to enhance observation.

Video displays of microscopic plants and animals, computerized systems for identifying insects, and hands-on experiments are a few of the techniques used to nurture visitor interest and learning. These and other innovative educational tools will be incorporated into NZP exhibits now under development.

The projects furthest along are the new Gibbon Island Exhibit and renovation of the waterfowl wetlands. The gibbon exhibit will be located on a wooded ridge, a naturalistic stage for the endangered forest apes, which will capture visitor interest with their spectacular movements and territorial calls. Situated in front of the Bird House, the Wetlands Exhibit is undergoing changes to improve the environment of its avian residents. Each spring, visitors will be able to observe the elaborate courtship rituals of ducks, geese, and swans.

Conceptual work on the Amazonian Aquatic Exhibit, the first phase of a planned aquatics complex, progressed in 1987. The Amazon River is the world's most diverse freshwater habitat—in terms of numbers of species, hydrology, and ecology. The river is inextricably tied to its surrounding environment, the largest continuous expanse of tropical forest, with an unparalleled diversity of life.



The Smithsonian's unrivaled expertise in tropical biology will be celebrated in the exhibit, and it will inform and guide the design of the exhibit.

In 1987, Zoo visitors could view more than thirty-three hundred mammals, birds, reptiles, and amphibians and more than fifteen hundred invertebrates. The number of births is an indication of the quality of care given these animals and those at the Conservation and Research Center. The 1,326 births in 1987—a 5 percent increase over the previous year—delighted Rock Creek visitors and bolstered NZP's stocks of threatened and endangered species. Among the newborns were a giraffe, saurus crane, and dwarf caiman, as well as cuttlefish and several golden-headed tamarins and small-clawed otters. More than 850 of the young animals were traded or sold to other zoos for their exhibits and breeding programs.

While very successful overall, the NZP's breeding program suffered a major setback in June, with the death of twin cubs born to the Zoo's giant panda Ling-Ling. One cub died almost immediately after birth, apparently from being undersized, but the second appeared strong enough to survive. For seventy-two hours, the newborn's condition and Ling-Ling's maternal vigilance raised the hopes of the NZP staff and of the millions of interested onlookers who monitored the cub's progress through news reports. On the third day, however, the cub died suddenly, succumbing to a systemic infection contracted after birth. Results of postmortem studies carried out by NZP staff are being used to guide efforts to improve survival prospects in the event of another giant panda birth.

With a gift from the people of Nepal, the NZP added two greater one-horned rhinoceroses to its collection. The young females, symbols of appreciation for the Smithsonian's contributions to Nepal's efforts to preserve its Royal Chitawan National Park, are expected to become part of a breeding program that will rebuild the Zoo's herd of Asian rhinos.

Registrar

The NZP is an important part of international efforts to track the genetic backgrounds of animals in captivity. For many years, the NZP's Registrar has contributed to the

These three kittens born at the National Zoo are from the first group of felids ever produced by *in vitro* fertilization—a vital first step in the long-term effort to save their endangered wild cousins.

development of the International Species Inventory System, a computerized recordkeeping system for managing and exchanging this essential information. In-house management of information is done with the Animal Records Keeping System (ARKS), which the NZP helped pioneer with the aid of a grant from the Smithsonian's Office of Information Resource Management. More than one hundred zoos have adopted ARKS. In 1987, seven of the NZP's eight animal-records desks used the microcomputer-based system for entering daily inventories; and for the first time, ARKS was used to produce the zoo's annual inventory.

In addition to keeping track of the number of annual births at the Zoo, the annual inventory (completed December 31, 1986) showed that the NZP acquired 2,025 animals. Of these, 1,524 were specimens for the new invertebrate collection. Other new additions included camels, golden-headed tamarins, beavers, Patagonian cavies, and pheasant pigeons.

Conservation

The Conservation and Research Center (CRC) leads the NZP's long-standing efforts to save threatened and endangered animal species. The center's activities encompass propagation of rare animals, studies of strategies and techniques for enhancing breeding success, studies of the underlying causes of a species' demise in the wild, and training programs to strengthen species-preservation efforts.

The Department of Conservation, housed at the CRC, had 379 mammals and 405 birds in its collection in 1987. Golden-lion tamarins, clouded leopards, Persian onagers, Przewalski horses, Eld's deer, and a Goeldi's monkey were among the rare mammals born in calendar year 1986. Hatchings included Guam rails, Bali mynahs, and red-crowned cranes. The births are important gains in efforts to prevent the extinction of several species.

For example, Guam rails, 9-inch-tall flightless birds, have all but disappeared from their Pacific island home, victims of a brown tree snake introduced to Guam in the late 1940s. The snake is believed to have wiped out three of the five bird species endemic to Guam. To bolster numbers of the remaining species—the rail and a kingfisher—the CRC has devoted an entire wing of its small-animal facility to the birds' care and breeding. The effort, directed by Dr. Scott Derrickson, NZP curator of birds, is part of an international collaboration.

In 1987, the American Association of Zoological Parks

and Aquariums (AAZPA) named Dr. Derrickson studbook keeper for the Guam rail rescue project. In addition, Dr. Derrickson received the Whooping Crane Conservation Association's Honor Award for his research on whooping cranes. Also in 1987, the AAZPA appointed NZP mammalogist Larry Collins studbook keeper for Matschie's tree kangaroo.

Among the new conservation projects begun last year was a cooperative program to develop techniques for propagating Hawaii's native forest birds. The U.S. Fish and Wildlife Service and the Bronx and Philadelphia zoos are the NZP's partners in this project. In addition, Dr. Christen Wemmer, who was appointed in August to the AAZPA's Wildlife Conservation Management Committee, and Dr. Rasanayagam Rudran began developing a management training course for zoo personnel in developing countries. The new course will be a natural extension of the Department of Conservation's other educational activities, which are drawing increasing numbers of students from around the world. In 1987, Dr. Rudran's Wildlife Conservation Training Course, for example, attracted twenty-four students from twelve countries. In addition, Dr. Rudran conducted field courses in Venezuela and Malaysia.

Animal Health and Pathology

Afflicted with a gastric ulcer, a male bongo calf housed at Rock Creek required surgery. After the ulcer was removed, the young African antelope was fed with a surgically implanted stomach tube. Seventy-five days after the operation, the calf's health was fully restored, and the animal was returned to the collection.

This episode attests to the high-quality care provided by NZP's Department of Animal Health (DAH). Sometimes the department's responsibilities require extensive measures, as in the case of the bongo calf, but more often they entail routine actions to safeguard the health of the NZP's inhabitants, at Rock Creek and Front Royal. The Zoo's health-care efforts are enhanced by a strong clinical research program, which places major emphasis on reproductive physiology. Moreover, the DAH trains veterinarians and veterinary students.

In 1987, the department created an Endocrine Research Laboratory at the CRC, and the new research arm immediately proved its value. Laboratory personnel developed radioimmunoassays for monitoring metabolites in urine. The results of preliminary studies indicate that the noninvasive techniques can be used to determine ovulation,

pregnancy, and onset of labor. Building on continuing NZP research, the laboratory intends to use similar tests for monitoring stress levels in animals. At the same time, other DAH teams are continuing studies on administering antibiotics and anesthesia to a variety of exotic species.

The DAH also achieved a research first in 1987. An in-vitro fertilization system developed by Zoo researchers resulted in the birth of kittens from domestic cats that had undergone embryo transfer. The kittens were the first carnivores ever produced through in-vitro fertilization. The accomplishment bodes well for efforts to replenish decreasing zoo stocks of endangered species of wild cats. The developers of the technique are already studying how to extend the procedure to nondomestic species of cats.

DAH researchers who are using the domestic ferret as a model for the endangered black-footed ferret achieved a similar milestone in 1987. Their technique for surgically implanting sperm cells into the uteruses of female European ferrets resulted in the births of more than one hundred kits. The successful effort established artificial insemination as an option for breeding programs to reverse the decline of black-footed ferrets, estimated to number eighteen.

Field studies also yield information that can improve the care and breeding of animals in captivity, while leading to insights on how to improve the odds for the species' survival in the wild. Teams of DAH researchers, including veterinarian Dr. R. Mitchell Bush, veterinarian Dr. Lindsay Phillips, Jr., and reproductive physiologist Dr. David E. Wildt, gathered medical and genetic data on elephants and lions in Sri Lanka, lions in India, and elephants and one-horned rhinoceroses in Nepal. The payoffs from such efforts are exemplified by the results of two major field studies completed by DAH researchers and their collaborators in 1987. Both studies reported a significant correlation between decreasing genetic diversity among wild populations of large carnivores and increasing reproductive defects, including high numbers of abnormal sperm cells.

The NZP's Department of Pathology is also concerned with animal health, but from the perspective of diagnosing diseases and devising measures to prevent infection. Research and training programs complement its activities. Examples of the department's research efforts during the past year include a study by summer preceptor Christine Plowman that resulted in the description of a new bacterial disease in iguanas and an investigation of medullary amyloidosis in dorcas gazelles by Dr. Bruce Rideout, pathology resident. In a collaborative study with

U.S. Fish and Wildlife Service's Patuxent Wildlife Research Center in Maryland, Dr. Richard Montali, head of the Department of Pathology, aided in identifying the cause of a disease outbreak in a flock of endangered whooping cranes. Dr. Montali also identified a parasitic encephalitis in a flock of macaws, completed a comparative study of diseases in captive and wild waterfowl, and participated in collaborative studies with researchers from other NZP departments.

Continuing research projects also reported substantial progress. Friends of the National Zoo (FONZ) research associate Dr. Ed Ramsay, Dr. Montali, and colleagues from the San Diego Zoo, Uniformed Services University of Health Sciences, and Walter Reed Army Institute of Research have succeeded in transmitting callitrichid hepatitis to laboratory primates. This essential step brings the researchers closer to their goal of isolating and defining the virus that causes a newly discovered disease in marmosets and tamarins. Dr. Don Nichols, Smithsonian postdoctoral fellow, cultured third-stage larvae of a worm that attacks the membranes surrounding the brain and spinal cord in exotic wild animals. Nichols grew the larvae in snails and slugs, the meningeal worm's intermediate hosts. Working at the Johns Hopkins University in Baltimore, he isolated antigens from adult worms and first- and third-stage larvae.

Research projects begun in 1987 included studies of a newly described lungworm in meerkats and of chromoblastomycosis in ornate horned frogs by Erica Miller, FONZ summer trainee; an investigation of mast-cell tumors in exotic carnivores by summer preceptor Marcie Engel; and a study of neurogenic pulmonary edema in exotic ungulates by Julia Carter, Smithsonian summer intern.

Nonmedical Research

More than seventy-five studies are under way in the Department of Zoological Research (DZR), most carried out in cooperation with other NZP departments or collaborators from other institutions. This broad research effort directly supports the NZP's overall aims of improving animal care, furthering conservation efforts, and fostering better understanding of animal behavior and biology. Benefits of DZR studies extend well beyond the NZP, however. The research supports worldwide efforts to preserve species diversity by providing the knowledge needed to guide these efforts and by training students who will carry them out in the future.



The rarely exhibited cuttlefish fascinates visitors to the new Invertebrate Exhibit at the National Zoo with its lightning-fast color changes.

Several DZR members continued to contribute to the Golden-Lion Tamarin Conservation Program in Brazil's Poço das Antas Reserve, where forty-six captive-bred animals (including twenty-two in September 1987) have been released to replenish the rapidly declining native population. Dr. Devra Kleiman, NZP's assistant director for research, chairs the International Golden-Lion Tamarin Management Committee. Kleiman, who in 1987 received the National Science Foundation's Women in Science and Engineering Award, studied the population dynamics of wild tamarin populations. With NZP research associate Dr. James Dietz, she monitored the status of the captive-bred animals. Research associate Dr. Lisa Forman, working with Dr. Dietz and research zoologist Dr. Katherine Ralls, began DNA-analysis studies to uncover information about kinship patterns and genetic variability in the wild and introduced tamarin populations.

Marine mammals were also studied in 1987. With associates from the U.S. Fish and Wildlife Service and the University of Minnesota, Dr. Ralls maintained her watch over endangered California sea otters. Using radiotelemetric techniques, the team is tracking the locations of otters along the California coast, yielding information about the population dynamics and social behavior of the animals. Dr. Olav Oftedal, NZP nutritionist, continued his comparative studies of milk production and its chemical content in pinnipeds, which include walruses, seals, and sea lions. Dr. Oftedal and Dr. Daryl Boness, who

also is participating in the pinniped study, began an investigation of lactation and postnatal growth of harbor seals. Also in 1987, Dr. Boness, NZP research zoologist, initiated a study of the behavior of endangered Hawaiian monk seals, while continuing his research on California sea lions and on hooded and harp seals.

Among the new bird-related studies begun in 1987 was an analysis of bird census data to uncover possible trends related to deforestation in tropical areas. The study is a collaborative project involving Smithsonian Research Associate Dr. Russell Greenberg, Dr. James Lynch of the Smithsonian Environmental Research Center, and a colleague from the U.S. Fish and Wildlife Service. In another cooperative project, Dr. Greenberg, DZR staff member Dr. Eugene Morton, and Dr. Kim Derrickson began preparations for a study that will use tiny telemetric devices to monitor the heart rates of birds. The aim of the study is to correlate the birds' physiological conditions with their overt behavior. Dr. Morton and Dr. Greenberg also continued their analysis of the feeding and foraging behavior of migratory birds. In addition, Dr. Morton collaborated with Dr. Derrickson in a study of the relationship between the size of the song repertoire of mockingbirds and the birds' reproductive success. With colleagues from the National Museum of Natural History, Dr. Morton also conducted research on the behavior and ecology of birds in Panama.

The subjects of studies of terrestrial mammals ranged

from elephants in Sri Lanka to chipmunks at the NZP. In addition to his teaching activities, Dr. Rudran advised Sri Lankan officials on their nation's wildlife research projects and assisted in developing a plan for elephant management and conservation. Also in Sri Lanka, research associate Dr. Wolfgang Dittus continued, for the eighteenth year, his sociodemographic studies of the toque macaque, and research associate Steve Thompson progressed in his fundamental study of the comparative energetics of sugar gliders, porcupines, tree kangaroos, and other marsupials and eutherian mammals. DZR population manager Jonathan Ballou continued his studies of the potential genetic perils of breeding programs and is developing techniques for estimating minimum viable

population sizes for species in the wild and those in captivity. With members of the Department of Pathology, Senior Smithsonian Postdoctoral Fellow Ted Grand began a comparative study of mammalian anatomy. Miles Roberts, coordinator for the Red Panda Species Survival Plan, completed a master plan for managing the population of red pandas in North American zoos and initiated a study of the behavioral ecology of the eastern chipmunk at the NZP.

Exhibits at the Rock Creek facility have proven fertile research sites. For example, Dr. Benjamin Beck, NZP's general curator, has used the zoo's free-roaming family of golden-lion tamarins, an exhibit he devised, to gain insights into efforts to introduce captive-born animals in

National Zoo keeper Morna Holden feeds the young greater one-horned rhinos donated to the people of the United States by the Prince of Nepal.



the wild. Dr. Edwin Gould, senior curator of mammals, is studying the zoo's collection of star-nosed moles to determine whether the strange "noses" of the elusive animals detect electrical impulses that guide their hunting efforts. The results of other ongoing studies are likely to influence the design of animal exhibits. Dr. John Seidensticker, associate curator of mammals, and Kathy Carlstead, a Smithsonian postdoctoral fellow, are evaluating the stereotypic behavior of animals. Through sampling techniques, they also are gauging the likelihood that visitors will see active animals, depending on the season and the time of day of their visits.

Dr. Dale Marcellini, newly appointed assistant to the director for applied research into the exhibitry and husbandry of zoo animals, used techniques for observing animals to study the behavior of visitors. The innovative approach may prove superior to questionnaires, the traditional but often disappointing tool for evaluating visitor interests and satisfaction.

Education and Public Affairs

The Office of Education informs and educates the NZP's large, diverse audience through a variety of creative materials and projects. Only a year old, the office's *National Zoo News* is already an unqualified success, keeping teachers in Washington, D.C., and surrounding areas abreast of zoo programs. More than thirty-six hundred grade school students have graduated from the office's seven-week course "Zoo Animals: A Closer Look," which celebrated its tenth anniversary in 1987.

Conservation themes have been incorporated into all of the NZP's public education programs and materials, and new conservation programs are being developed for grade school and junior high students. The innovative "ZooArk," a temporary exhibition on zoos and worldwide conservation issues, captured visitor interest during its one-year debut at the Zoo. The Smithsonian Institution Traveling Exhibition Service intends to circulate the interactive exhibits to other zoos and to museums of natural history.

Complementary activities are carried out by the Office of Public Affairs, the NZP's direct contact with the public and media. The office responds to questions, notifies the public of NZP happenings, and provides informational and organizational support for major events. During the three days in June when much of the nation was tracking the status of the newly born giant panda cubs, the public affairs staff responded by organizing news conferences

and producing a series of fact sheets and news releases. Along with its many other duties during the past year, the staff coordinated activities related to the awarding of NZP Silver Medals to Dr. E. O. Wilson and Sir David Attenborough for their contributions to zoological science and conservation.

The popularity of Sunset Serenades, the office's four-year-old summer concert series, continued to grow in 1987. More than six hundred people attended each of the six concerts held on the Zoo grounds. The office also organized the 1987 annual public symposium "Behind the Scenes: Animal Studies at the Zoo," which introduced the public to the NZP's research programs and achievements.

Construction and Support Services

The Office of Facilities Management (OFM) is the behind-the-scenes unit that provides construction, police and safety, and other services that support the full range of NZP activities. Its craftspeople built the majority of the new Invertebrate Exhibit, and they are engaged in a variety of other construction and renovation projects. Major construction projects in 1987 included completion of the veterinary hospital at Front Royal. Projects begun in 1987 included construction of the Rock Creek veterinary hospital and the Gibbon Island Exhibit, renovation of the Wetlands Exhibit, and initial designs for the Amazonia Exhibit, reconstruction of the third section of the Olmsted Walk, and renovation of the Rock Creek hospital/research building. In addition, the office is increasing the number and quality of plantings on the Rock Creek grounds, contributing to the Zoo's transformation into a biological park.

The Office of Facilities Management (OFM) grew with the addition of the Exhibits Production Unit created from the Office of Graphics and Exhibits, which was renamed the Office of Design and Exhibit Planning. OFM provided major support to the new Invertebrate Exhibit, constructing a majority of the exhibit. Enhancing the Zoo's BioPark theme, strong emphasis has been placed on improving the quality and quantity of exhibit plantings throughout the park.

Staff Changes and Appointments

Administrative changes enacted in 1987 will enhance the NZP's efforts to transform itself into a biological park. George Calise was appointed associate director, and Elsa

Jablonski was named the NZP's first director of development. Dr. Edwin Gould was appointed assistant to the director for biopark programs, and Dr. Dale Marcellini was appointed assistant to the director for applied research in the exhibitry and husbandry of zoo animals.

Friends of the National Zoo

A voluntary organization with more than fifty thousand members, the Friends of the National Zoo (FONZ) contributed in many ways to the NZP's accomplishments in 1987. The organization responded to the opening of the Invertebrate Exhibit, for example, by recruiting greatly needed volunteers to lead tours, manage the information desk, and assist keepers. These able volunteers were key to the exhibit's successful opening.

Fund-raising efforts in 1987 added to the organization's string of annual successes. Attendance at the members' annual ZooNight was outstanding, and the fourth National ZooFari resulted in a sizable contribution to the Theodore H. Reed Animal Acquisition Fund. FONZ grants to the NZP for wildlife research and other programs totaled more than \$510,000 in 1987.

Visitor Services was expanded and enhanced. New items were added to the menu and new food and gift carts were introduced to improve service to the public. Plans to quadruple the size of the Book Store Gallery were begun in 1987.

Financial information for calendar year 1986 is given below. A percentage of revenues from Zoo Services is paid to the Smithsonian for the benefit of the National Zoo and is reported as income by the Institution.

Friends of the National Zoo Financial Report for January 1–December 31, 1986
(thousands of dollars)

	Net revenue	Expense	Net change in fund balance
Fund balance, 1/1/86			\$1,707 ¹
Services			
Membership	\$ 677	\$ 595	82
Publications	125	157	-32
Education ^b	108	859	-751
Zoo Services ^c	5,856	4,815 ^d	1,041
Total	<u>\$6,766</u>	<u>\$6,426</u>	<u>\$340</u>
Fund balance, 12/31/86			\$2,047 ^e

¹Excludes \$232,000 of deferred revenue—unrestricted for membership dues; this was an accounting change for the 1985 calendar year.

^bExcludes services worth an estimated \$501,814 contributed by FONZ volunteers.

^cIncludes gift shops, parking services, and food services.

^dIncludes \$459,712 paid to the Smithsonian Institution under contractual agreement.

^eNet worth, including fixed assets, to be used for the benefit of educational and scientific work at the National Zoological Park.

Office of American Studies

The Office of American Studies continued its program in graduate education. This program, now in its twentieth year, was designed to encourage research in the field of material culture, utilizing the collections and personnel of the Smithsonian's many museums. An additional purpose was to overcome the separation then existing between university and museum scholars. Through formal courses conducted at the Smithsonian, graduate students from cooperating universities were encouraged to take advantage of the opportunities offered by the national museums. Courses have dealt with art, technology, and social, cultural, and political history. The research interests of participating students have ranged from art to anthropology.

The 1986 fall semester seminar in "Material Aspects of American Civilization" again focused on topics related to exploration and travel. The seminar was taught by Wilcomb E. Washburn, director of the program, and Bernard Mergen, of George Washington University. Nine students participated—eight from George Washington University and one from the University of Maryland.

Other seminars during the past year included "The Decorative Arts in America," taught by Barbara G. Carson, of George Washington University, and "Art in History," taught by Ann Palumbo, also of George Washington University. Forty-five students participated in these seminars.

Two graduate students are pursuing specialized research under the supervision of the office's director. Dr. Washburn continued his work in early exploration and discovery, museum history, and anthropology.

Office of Fellowships and Grants

The Office of Fellowships and Grants (OFG) administers and helps coordinate the numerous Smithsonian programs designed to assist scholars and students from the United States and throughout the world in utilizing the Institution's unique resources. These programs support participants' research in art, history, and science, conducted at Smithsonian facilities in conjunction with the Institution's professional staff. More than seven hundred scholars and students received awards administered by OFG in 1987.

The awards include long- and short-term residential appointments for undergraduate, graduate, and postdoctoral students and for scholars in the humanities and sciences. The Institution's academic programs are an important complement to those offered by universities. The Smithsonian collections and the curators who study them are unparalleled resources, unavailable anywhere else and essential to many research pursuits. At the Smithsonian, historical and anthropological objects, original works of art, natural history specimens, living plants and animals, entire ecosystems, and even the extraterrestrial are available for study.

Programs for Visiting Students and Scholars

The office awarded seventy-nine predoctoral, postdoctoral, and senior postdoctoral Smithsonian Research Fellowships in 1987, including seventeen to foreign students from nine countries. Participants in the twenty-two-year-old fellowship program conduct independent studies under the guidance of staff. Research is carried out at one of the Institution's bureaus or field sites, usually over a period of six months to a year. Study topics in 1987 spanned a diverse range of scholarly interests, from the role of gift exchange in America to the archaeometallurgy of ancient Anatolia. Other topics included the volcano as image and symbol in nineteenth-century American art; animal foraging, competition, and discounted future rewards; genetic and environmental correlates of polymorphism in marine cheilostome bryozoa; and predation, mass extinction, and the fate of crinoids (a class of marine invertebrates) during the Mesozoic era.

Fifteen U.S. and four foreign graduate students in the early stages of their research programs received ten-week fellowships in 1987. The awards allowed the students to explore areas that they are considering as the subjects of their dissertation research. The 1987 fellows studied such topics as the comparative morphology of the external silk-spinning structure of spiders, Creek Indians and the

eighteenth-century deerskin trade, the San Francisco school of abstract expressionism, and the role of the federal government in the development of the U.S. computer industry.

Smithsonian Institution Regents Fellows in residence in 1987 included Stanford University's Wanda Corn, whose topic of study at the National Museum of American Art was cultural nationalism in the art of post-World War I America. At the Smithsonian Tropical Research Institute, Daniel Morse, University of California at Santa Barbara, began a study of the molecular biology of invertebrate larvae that inhabit coral reefs. At the National Zoological Park, Regents Fellow Michael Soule examined the social and philosophical implications of conservation biology and investigated new methods for studying morphological and genetic variations in animal populations.

The Institution also awarded two two-year Webb Fellowships, named in honor of Regent Emeritus James E. Webb and designed to promote excellence in the management of cultural and scientific nonprofit organizations.

Herbert M. Cole, University of California at Santa Barbara, was the recipient of a fellowship in 1987 to study archetypes in African art at the National Museum of African Art. The fellowship is funded through a grant from the Rockefeller Foundation Program in the Humanities to support postdoctoral fellowships at the National Museum of African Art and the Freer and Sackler galleries.

Through long- and short-term fellowships and through other activities, the Smithsonian aims to cultivate greater participation by minority scholars in the Institution's programs. In 1987, a Faculty Fellowship was awarded to Carolivia Herron, Harvard University, to examine approaches to the study of Afro-American visual art.

In addition to the Institution-wide programs funded through OFG, the office administers fellowships and other awards funded through Smithsonian bureaus. At the National Air and Space Museum, 1987 awards included appointments to the International Fellowship, Martin Marietta Chair in Space History, and the Charles A. Lindbergh Professorship in Aerospace History.

At the Smithsonian Tropical Research Institute, research fellowships funded by the Jessie Noyes Foundation were awarded to three predoctoral students, from Colombia, Panama, and Costa Rica. The Smithsonian Astrophysical Observatory awarded three postdoctoral and five predoctoral fellowships in 1987.

In addition, OFG assisted in the awarding of two new graduate fellowships in conservation science, the product of a joint program between the Institution's Conservation

Analytical Laboratory and the Department of Materials Science and Engineering at the Johns Hopkins University.

During 1987, bureaus, in cooperation with OFG, continued to offer short-term support for visiting scientists and scholars. This aid enabled forty-four researchers to visit Smithsonian facilities and confer with staff members. These programs are supplemented by OFG's growing Short Term Visitor Program, which is attracting an increasing number of scholars from developing countries. The program assisted 172 scholars—including 73 international visitors representing 31 nations—who came to the Institution to conduct research, examine collections, or meet with professional staff members.

OFG's three-year-old workshop program again was successful in supporting gatherings of scholars and experts to discuss issues of mutual or complementary interest. Last year, the program supported sixteen workshops organized by Smithsonian research and museum staff members. Lasting from one to several days, the workshops focused on such topics as psychoanalysis and society in Africa, blue crab ecology, the evolution of terrestrial ecosystems, and inversion techniques in helioseismology.

Internships and Other Programs

The number of internships offered by the Smithsonian continues to grow, reflecting both the popularity and the effectiveness of these programs. Through OFG, the National Air and Space Museum supported ten undergraduate interns in 1987. The Cooper-Hewitt Museum supported six students, and twelve students participated in the Smithsonian Environmental Research Center's work-and-learn program in environmental studies. The Hirshhorn Museum and Sculpture Garden and the National Museum of American Art each supported four student interns. In addition, twelve students participated in the Smith College-Smithsonian Program in American Studies. The eight-year-old program features a seminar course and research projects conducted under the direction of staff members.

High school students also took advantage of the Institution's internship opportunities. In 1987, forty-three were supported through the Office of Elementary and Secondary Education. During five-week sessions, the interns participated in programs designed to broaden an existing academic interest or vocational skill. For the Office of Elementary and Secondary Education, OFG administered the five appointments to the Teacher Intern

Program. This program gives high school teachers the opportunity to delve into their academic interests, and it addresses ways in which the participants can assist local museums in developing programs for adolescents.

The office supplemented these programs with efforts aimed at increasing the participation of minority students in Smithsonian research activities and other programs. Thirty-one undergraduate and graduate minority students were awarded internships in a variety of bureaus and offices on the Mall, the Smithsonian Environmental Research Center, and the National Zoological Park.

In 1987, the office, in collaboration with the bureaus, created a special program for Native American students and community scholars. Under the new program, seven short-term appointments were made. Topics studied by the Native American scholars while at the Smithsonian included the breakup of the Great Sioux Nation and the role of women in contemporary trends in American Indian art.

With the support of a grant from the Educational Outreach Program, OFG and Howard University developed a study program to promote minority interest in natural history. Two faculty members from the university's Department of Zoology and Botany designed a ten-day field course for eight undergraduates. The course was held at the Smithsonian Tropical Research Institute and included talks by members of the institute staff.

The office continued to administer cooperative education appointments aimed at minority graduate students whose research interests coincide with those of the Institution. In 1987, two appointments were made. The students will work in professional positions at the Smithsonian while continuing their university education. The appointments hold the potential for permanent employment at the Smithsonian.

The Education Fellowship Program, which offers support for graduate study and research training, also continued to encourage the participation of minorities in the Institution's fields of interest. In 1987, a fellowship recipient at Harvard University received his doctorate in astrophysics and was appointed to a position at the Smithsonian Astrophysical Observatory. Another recipient completed his first year of graduate study in the Department of Anthropology at the University of Massachusetts and spent part of the summer working at the National Museum of Natural History.

In 1987, twelve persons were selected to participate in two sessions of the Visiting Associates Program. Participants in the two-year-old program were university and college faculty members and administrators committed to

expanding minority participation in higher education. The week-long sessions were designed to acquaint the visiting associates with Smithsonian research programs and opportunities for independent and collaborative studies. The associates were asked to serve as contacts and to disseminate this information among their respective academic communities.

Also during the past year, OFG assumed administration of the Scholarly Studies Program. This competitive grant program provides funding for Smithsonian staff and their collaborators to conduct research that falls outside the purview of traditional sources of support. As a result of two meetings of a review committee composed of scholars from the Smithsonian and elsewhere, twenty-nine grants were awarded in 1987.

Smithsonian Astrophysical Observatory

On February 24, 1987, a Canadian astronomer working at the Las Campanas Observatory in Chile discovered a supernova in the Large Magellanic Cloud, a companion galaxy to the Milky Way visible from the Southern Hemisphere. The exploding star was the brightest seen in more than four hundred years and the first discovered early enough after its explosion to allow detailed studies with the full range of modern astronomical instruments.

Supernova 1987A (SN 1987A), as the object is officially known, dominated astronomical research throughout the remaining months of 1987, as astronomers sought new clues to stellar evolution. Scientists from the Harvard-Smithsonian Center for Astrophysics (CfA) were at the forefront of this research.

For example, one night after the exploding star was discovered, a CfA X-ray specialist working at the Cerro Tololo InterAmerican Observatory, also in Chile, produced optical photos of the supernova that were distributed worldwide. Similarly, the first official announcement of the discovery was issued by the International Astronomical Union's (IAU's) Central Bureau for Astronomical Telegrams, headquartered at CfA. A torrent of information, based on subsequent studies and observations, flowed from the bureau, with some 30 IAU *Circulars* issued during the first twenty days after the discovery and a record-breaking 190 over the course of the year.

The initial announcement was greeted with an intense wave of research activity. Within hours, a CfA astronomer used the *International Ultraviolet Explorer* to investigate the supernova, pinning down, among other things, the original identity of the spectacular object. Comparing ultraviolet spectral data from the satellite with preexplosion astrometric measurements of candidate stars, he and a colleague determined that SN 1987A's progenitor was Sanduleak -69 202, a blue supergiant star.

Almost simultaneously with this study, the CfA initiated and coordinated an international experiment using very long baseline interferometry (VLBI) to probe the supernova's radiosphere. Observations suggested that, five days after the explosion, the supernova's radio shell was larger than its visible disk, with a diameter at least twelve thousand times that of the Sun.

The most exciting—and most surprising—result was the discovery of an enigmatic and inexplicably bright object close to SN 1987A. A CfA research team found the "companion" through optical speckle interferometry observations, made in late April with the 4-meter telescope at Cerro Tololo. (The electronic camera used to make these observations is a new astronomical-imaging instru-

ment. By means of rapid multiple exposures, the camera compensates for blurring motions in the Earth's atmosphere.) The apparent brightness of the object (only three magnitudes fainter than the supernova) and its apparent closeness to the supernova (separated, perhaps, by as little as seventeen light-days) suggested that the companion was linked to the stellar explosion. Because the object was not seen before the supernova, it must have been at least one hundred times fainter—if, indeed, it even existed before the explosion! Months after the observation, the origin and nature of the object continued to evade explanation.

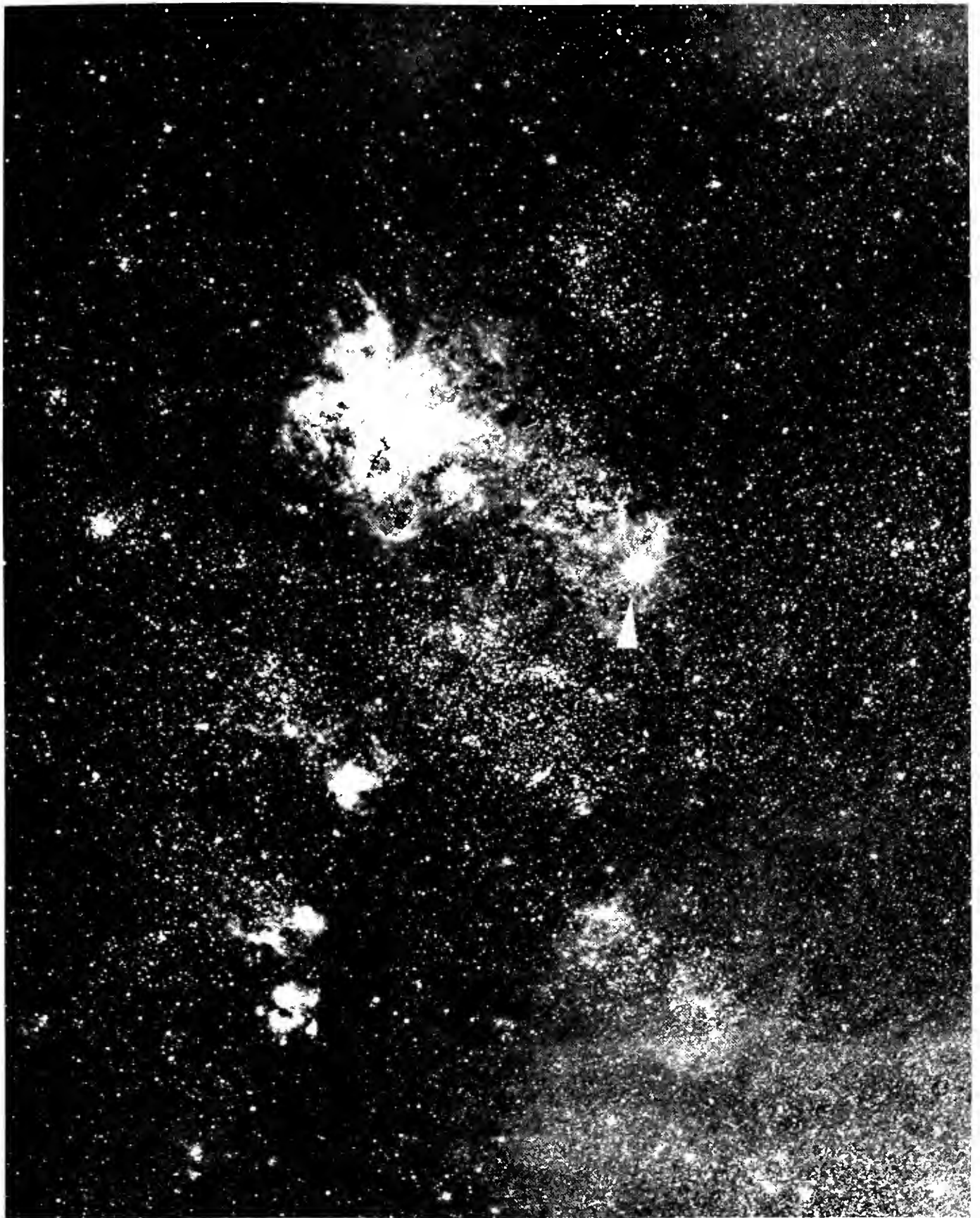
The interdisciplinary approach to studying Supernova 1987A underscores the multifaceted program of the CfA and its ability to respond quickly to major research opportunities. Formed in 1973 to coordinate the related interests of the Smithsonian Astrophysical Observatory and the Harvard College Observatory under a single director, the CfA studies the basic physical processes that determine the nature and evolution of the universe. These investigations, touching on almost all major topics in modern astronomy, are organized by divisions. Some highlights of research in each of these divisions during the past year follow.

Atomic and Molecular Physics

To interpret observations of astronomical objects, it is necessary to understand how atoms and molecules interact with each other and with light. The division's laboratory and theoretical studies seek to explain these interactions.

CfA scientists are measuring, for example, the ways in which sunlight can break apart oxygen molecules in the Earth's atmosphere. This year, they made the first theoretical calculations of the rate of atomic oxygen production from oxygen molecules that break apart almost immediately after absorbing an electron. This is a key process in the ozone chemistry of the stratosphere, the protective layer that filters out the Sun's harmful ultraviolet

Supernova 1987A (arrow) in the Large Magellanic Cloud was photographed at the Cerro Tololo InterAmerican Observatory in Chile by Wendy Roberts of the Harvard-Smithsonian Center for Astrophysics on February 25, 1987, one night after its discovery. (NOAO photograph)



let rays. In addition, knowledge of the process contributes to understanding the “greenhouse effect” now thought to be warming the Earth.

Astronomers in the division are also studying the distribution of interstellar carbon monoxide to map the distribution of molecules in giant clouds in the Milky Way. Interpreting these maps, however, requires knowledge of how starlight breaks down carbon monoxide molecules. Thus, CfA scientists devised a mathematical model to identify potential mechanisms involved in this poorly understood process. They have compared their calculations with corresponding measurements made in collaboration with researchers from the Japanese National Laboratory, using radiation from that facility’s “photon factory.”

High-Energy Astrophysics

Research in high-energy astrophysics is concerned with some of the most energetic objects and processes in nature—specifically, the mechanisms that generate X-ray radiation from cosmic objects. Because X-rays are absorbed by the Earth’s atmosphere, observations in this field are made from balloons, rockets, and satellites. Division scientists and engineers are currently analyzing X-ray data from past spaceflights, and they are designing and developing new instrumentation for future missions.

The extremely violent events taking place in the cores of galaxies and in quasars intrigue and puzzle scientists. Although these latter objects radiate immense amounts of energy across the entire spectrum, from low-energy radio waves to the extremely high-energy X-rays and gamma rays, their behavior can change over periods as short as a few days. CfA scientists have been piecing together a picture of the way emissions vary in time and energy. Preliminary results suggest that one process may generate infrared and X-ray emissions, while another, involving a disklike structure of material spiraling inward toward a central black hole, may be responsible for the optical, ultraviolet, and lowest-energy X-ray radiation.

The X-ray satellite *Einstein*, created largely through the efforts of CfA scientists and engineers, produced a priceless archive of observations of 10 percent of the sky. Using the Einstein Data Bank, CfA scientists and more than 130 visiting researchers have been able to catalogue X-ray sources and make maps of the distribution of cosmic X-rays. These tools will guide future systematic X-ray studies of stars, galaxies, clusters of galaxies, and quasars.

Optical and Infrared Astronomy

CfA research in optical and infrared astronomy concentrates on the large-scale structure of the universe and on the formation and evolution of stars and galaxies. In support of this research, the center operates the Fred Lawrence Whipple Observatory on Mount Hopkins in Arizona. The observatory contains the Multiple Mirror Telescope (MMT), operated jointly with the University of Arizona. It also houses two smaller telescopes, which are used for large-scale surveys and to supplement MMT-based research, and a light collector measuring 10 meters in diameter. Used for ground-based searches for high-energy gamma rays from celestial sources, this collector is the most sensitive instrument of its type in the world.

In one long-term program, CfA scientists are creating a three-dimensional map of the distribution of more than ten thousand galaxies within about three hundred million light-years of our own Milky Way. The survey’s first “slice of the universe” indicated that the galaxies are distributed on the surfaces of enormous bubblelike voids, some more than one hundred million light-years in diameter. Three such slices, including more than twenty-five hundred galaxies, are now complete. The new data confirm the early evidence of the bubblelike distribution of galaxies on very large scales, posing a serious challenge to traditional models of the evolution of the universe.

A CfA scientist was on the international team that discovered what may be the first true “binary quasar system.” The two quasars, located twelve billion light-years from Earth in the direction of the constellation Crater, were first identified in optical observations made at the European Southern Observatory in La Silla, Chile. Spectral data gathered with the MMT confirmed that the two objects were located at approximately the same distance from the Earth; and radio observations made with the Very Large Array in New Mexico established the binary nature of the quasars, ruling out the effect of a gravitational lens. The proximity of the objects suggests that they may be interacting, either in orbit about each other or in near collision.

The MMT is also being used to survey potentially as many as one thousand non-radio-emitting quasars, known as QSOs. The effort is an ambitious attempt to establish statistical standards of distribution and luminosity. Candidates for MMT observation and spectral analysis are selected from photographic plates by an automated measuring device at Cambridge University. Already, the survey has discovered some 250 new QSOs.

Planetary Sciences

The planetary sciences division concentrates on the planets, satellites, and small bodies of the Solar System, as well as on the processes that created them billions of years ago.

CfA scientists continue to examine information obtained during *Voyager* spacecraft encounters with the outer planets. Much of last year's effort was devoted to examining and interpreting data describing the satellites of Jupiter. Mapping of the geological formations on Ganymede was completed, and analysis of images of Europa suggested that material from that satellite's interior may be venting through its ice-covered surface. In a related ground-based effort, observations of the eclipses and occultations of Jupiter's bright satellites were used to study the dissipation of energy in the interior of the planet.

Major concerns of the division's theorists include the evolution of the early solar nebula—the stuff from which planets were made—and the high-energy events and processes responsible for certain properties of meteorites and planets. An example of work in this area is a study that could resolve a long-standing mystery of the Solar System—the origin of the Moon. Two CfA scientists presented a convincing argument that the Moon was created by a collision between Earth and another body perhaps 1.2 times the mass of Mars.

Although the Apollo missions ended more than a decade ago, the lunar rocks collected during these missions continue to reveal their secrets. Laboratory studies of samples from the Apollo 15 mission found a previously unrecognized variety of igneous rock in the lunar highlands. This discovery provides new information about the way the lunar surface separated into layers of differing chemical composition.

Where and how comets form are persisting questions. The comets that periodically approach the Sun are believed to come from a halo around the Solar System, far beyond the orbit of Pluto. Computations by a CfA scientist suggest that as many as two-thirds of these comets may have formed in a shell-like region centered about the Sun, but extending from one thousand to ten thousand times the Earth's distance from the Sun.

Radio and Geoastronomy

Research in radio astronomy contributes to greater understanding of the universe and of Earth itself. Some CfA

scientists are studying the structure, evolution, sources of energy, and ultimate fate of astronomical objects that emit radio waves throughout the universe. Other CfA scientists use the radio astronomy technique of very long baseline interferometry to measure the drifting of continents and to probe the Earth's interior structure. Still other scientists in this division are developing atomic clocks, testing the theory of general relativity, designing and building advanced optical interferometers, and designing space tethers to probe the outer reaches of the Earth's atmosphere.

One group is attempting to measure the size of the Milky Way and the distance to nearby galaxies. They have mapped with extraordinary precision the relative motions of water-vapor masers (amplified emissions of microwaves) around a newly formed massive star. From this information, they determined the distance that separates us from the center of the Milky Way, thus improving the accuracy of previous measurements of this distance. CfA scientists also made the first epoch measurements of the motions of two maser complexes in the neighboring galaxy M33. Data gathered over the next several years should allow the first-ever measurement of this galaxy's rotation.

In 1987, division scientists and engineers also completed the installation of a two-element, 20-meter-baseline optical interferometer at the Mount Wilson Observatory. In initial tests, the "Mark II," which was built in collaboration with other institutions, successfully measured the positions of five stars, tracking these stars over wide angles as the Earth rotated. Interferometry, a common observing technique in radio astronomy, is being used increasingly in optical astronomy. This prototype instrument shows great promise as a tool for the precise measurement of stellar positions.

Solar and Stellar Physics

In addition to seizing the research opportunities presented by Supernova 1987A, scientists in this division made significant progress in studies of physical processes operating in the Sun and other stars. A major emphasis was the study of the behavior of hot gas under varied conditions—in extended stellar atmospheres, in the interstellar medium, and in material ejected from young stars and supernovae.

Continuing observations of a young variable star by two CfA scientists provide evidence that material from a

surrounding disk is falling onto the star's surface. The cause of the process is unknown, but the observations indicate that the star is growing as a result of mass transfer. Observations of similar stars will be needed to determine whether disk systems, the precursors of planets, are common to all young stars.

Periodic variations—probably pulsations—were found in the bright red supergiant star Betelgeuse in Orion by a team of division scientists. Although variations in this star's brightness have long been suspected, it took a dedicated monitoring program, using both satellite and ground-based instruments, to pin down the 420-day cycle of changes in luminosity. This feature may hold the key to understanding how Betelgeuse's great extended atmosphere—some three thousand times that of the Sun—was created.

Measurements of brightness variations in stars suspected of having "spotted surfaces" were made with photoelectric telescopes operated by a private group at the Whipple Observatory. These completely automated instruments made long-term measurements that complemented data obtained by CfA researchers at the Mount Wilson Observatory.

Theoretical Astrophysics

CfA theorists seek to explain the underlying principles and processes that govern the behavior of the universe. They derive their insights from analyses of experimental data and mathematical models.

Last year, studies carried out in the division addressed a wide range of topics, from interpretations of the first observation of neutrinos from the collapse of a supernova core, to the evolution of localized "inflationary universes" that, from the outside, might appear to be black holes. Research also addressed "cosmic strings," the hypothesized artifacts of the very early universe. A CfA scientist and colleague from another institution developed a model to explain how these strings, if they exist, might serve as sources of the enormous amounts of energy generated in quasars. Another CfA scientist analyzed processes that might limit the size of the massive black hole hypothesized to lie at the center of the Milky Way.

Other work included studies of gas flow into black holes, the interiors of neutron stars, the properties of atoms and molecules in interstellar space, the formation of spiral structure in galaxies, and the formation of planets in the early Solar System.

Science Education

In addition to advances in astrophysics research, the CfA also made progress in Project STAR (Science Teaching through Astronomical Roots). Sponsored by the National Science Foundation, this program is designed to improve the teaching of secondary school science through the use of examples from astronomy and supporting materials. Eighteen high school science teachers from around the country attended the second Summer Workshop for Educators, held in Cambridge. During the two-week program, the teachers participated in seminars, discussions, and laboratory exercises that drew upon CfA resources and the expertise of its staff.

Results of a survey mailed to some six thousand randomly selected science teachers revealed that at least 10 percent would teach an astronomy course in their high schools if suitable materials were available. This interest suggests a demand for the type of texts, activities, and teacher training programs now being developed in Project STAR.

Smithsonian Environmental Research Center

Studies at the Smithsonian Environmental Research Center (SERC), located in Edgewater, Maryland, help unravel the complex web of factors that influence the health of the environment. Occupying 2,600 acres bordering the Rhode River, a tributary of the Chesapeake Bay, the center carries out long-term interdisciplinary studies, in the field and in the laboratory.

The center complements its research activities through educational programs for students—from undergraduates to postdoctoral fellows—and for the public. Teacher- and docent-led tours acquaint the public with the center's mission and facilities. Hiking along the two-mile Discovery Trail or participating in center-organized canoe outings on the tidal river introduce visitors to the wonders and vulnerabilities of the coastal environment.

Through seminars, a regular SERC activity, center researchers and their counterparts from universities and governmental laboratories keep each other abreast of work and issues in areas of mutual interest. In addition, the center organized and hosted in 1987 a scientific workshop on the biology of portunid (swimming) crabs.

The sampling of 1987 research activities described below illustrates how SERC studies contribute to a better understanding of complex environmental phenomena and problems. Research is conducted by staff scientists, who represent a diverse array of disciplines, and by visiting scientists and students.

Impact of Acid Deposition

The impact of acid precipitation on coastal-plain hardwood forests has been a matter of concern in recent years, although few studies have addressed the issue. To help fill gaps in understanding, SERC researchers constructed a detailed "acid budget" for a mature forest adjacent to the Chesapeake Bay. A type of scientific accounting system, the budget tracked acid inputs and the amount of acid flowing from the drainage basin into the Bay over a four-year period.

The acid levels of precipitation and stream water were strongly correlated, and the average annual pH of both declined significantly between 1975 and 1984. (The acronym for potential of hydrogen, pH is a measure of acidity, with a pH of 1 being most acidic, a pH of 7 neutral, and pH of 14 most alkaline.) Precipitation was primarily a dilute solution of sulfuric and nitric acids, with small amounts of ammonium, chloride, and metallic cations (positively charged metal ions). Stream water, in con-

trast, was largely a solution of metallic sulfates and chlorides. The differences in acid composition reflect how soil and vegetation process rainwater and snow melt. Nearly all of the ammonium, hydronium, and nitrate ions were intercepted and retained by the forest, but a substantial portion of the sulfates were not. Moreover, precipitation leached aluminum and other metallic cations from watershed vegetation and soil.

The watershed ecosystem neutralized 98 percent of the acid inputs. Yet, the remaining 2 percent were sufficient to acidify waters draining into watershed streams. Nitric acid in the precipitation did not affect stream chemistry because of the nearly complete retention of nitrates within the ecosystem; nor did acids from natural sources, such as from the dissociation of carbonic and other organic acids. Sulfuric acid was the pollutant primarily responsible for cation leaching and stream acidification. The loss of metallic cations other than calcium did not seem to threaten forest vegetation because of the soil's high content of metals and replenishment from weathering. Calcium, however, is present in the soil only in trace amounts. Assuming no replenishment of the element, continuation of current leaching rates would deplete calcium levels in the soil by more than a third in seventy years.

Small, primary streams in the watershed underwent the greatest surges in acidity, falling to a pH level as low as 3.2. Moreover, concentrations of aluminum, dissolved from minerals in clay soils, were high. Larger streams were observed to have surges in acidity with pH minima below 5.

Surges in acidity occurred during accelerated groundwater percolation following storms and did not coincide with surface runoff or snow melt. One reason why groundwater is more acidic is that plants exchange their hydronium ions for the soil's alkaline cations. During a storm, hydronium ions in the precipitation displace some of the alkaline cations that had been translocated to the plant canopy, while hydronium ions that had accumulated in the soil percolate through the soil and into local streams. As a result, surface runoff is enriched in alkaline cations and groundwater is enriched in hydronium ions.

Acidity levels of drainage in the forested portion of the watershed were most closely tied to the pH of precipitation. On average, forest drainage was the most acidic, the highest in aluminum content, and the lowest in calcium content. Surges in acidity, however, were most severe in pastureland drainage, followed by cropland drainage. The study results indicate that land manage-



Dr. Bert Drake, plant physiologist at the Smithsonian Environmental Research Center, adjusts controls of an open-top marsh chamber in which carbon dioxide gas concentrations have been doubled to allow measurement of direct and indirect environmental effects.

ment strongly influences the acidity of water draining agricultural areas.

Bioassays suggest that aquatic wildlife species vary in their vulnerability to levels of acidity recorded in the study. The results of the assays, conducted at the center, indicate negligible toxicity to tree frogs (*Hyla crucifer*) at a pH level of 5. The same level of acidity caused significant toxicity to yellow perch (*Perca flavescens*) and had drastic effects on striped bass (*Morone saxatilis*).

Bird/Habitat Relationships

Center researchers measured abundances of nesting birds over four breeding seasons in a successional series of habitats, from recently abandoned pasture to mature hardwood forest. Species such as yellow-breasted chat and

white-eyed vireo, as determined from mist-net capture rates, were most abundant. These species congregated in early successional habitats. Overall, the number of birds in a specific habitat increased from abandoned pasture to mature forest. Species diversity, however, was greatest in the intermediate-aged forest. Areas of high capture rates for particular species did not correspond with the locations of singing males of those species. This finding suggests that habitat suitable for singing perches may differ substantially from the habitat used for feeding and other activities.

Ant Abundance and Diversity

On the forest floor reside teeming populations of ants, important links in the terrestrial food web. A center

study of ant populations in the litter and soil of a mature forest in the Rhode River watershed counted twenty-two species, although ten accounted for more than 95 percent of the individuals collected. The density of ants per unit of surface area in the top 10 centimeters of soil was more than three times greater than in the overlying litter. Seasonal differences in ant abundance and community composition were significantly correlated with surface temperature and largely independent of soil moisture content and of the amount and type of overlying leaf litter. Ant density and biomass were high, rivaling values previously reported for tropical forests.

Riparian Forests

Streamside, or riparian, forests are natural buffers, filtering out pollutants in runoff from developed and agricultural uplands. SERC scientists developed detailed hydrologic budgets for forests lining streams that drain into the Chesapeake Bay. Over the two-year study period, 62 percent of the rain or agricultural runoff entering the forests did not reach watershed streams. This water either evaporated or was transpired by forest vegetation. In fact, the amount of water returned to the atmosphere by transpiring plants exceeded total precipitation by about 8 centimeters per year. The study also found that riparian forests neutralized more than 90 percent of the acidity in cropland runoff.

Effects of Increased Carbon Dioxide

Concentrations of carbon dioxide in the Earth's atmosphere have been increasing about half a percent per year and are expected to double over current levels during the next century. The effects of the expected buildup are likely to be fickle, affecting, for example, some plant species more than others. In the Chesapeake Bay tidal marshes, such selective effects could dramatically alter the character of plant communities in unanticipated ways. Field studies by SERC researchers indicate that changes may already be under way. Increasing levels of carbon dioxide were found to reduce the water requirements of plants and, therefore, decrease their level of salt stress. In the longer term, plant species that are better equipped to assimilate and process increasing concentrations of carbon dioxide are likely to flourish at the expense of other species. As a result, sedges, for example, may displace marsh grasses.

Using open-top chambers that are continuously enriched with carbon dioxide during the growing season, SERC scientists are conducting carefully controlled studies of the direct and indirect effects of the gas buildup on Chesapeake Bay plant communities. The researchers are monitoring rates of photosynthesis and respiration, water balance, and nutrient dynamics in experimental plants, which during the day are exposed to twice the current ambient levels of carbon dioxide in the atmosphere. These measurements are compared with those for controls. Results of the study will provide a baseline for gauging carbon dioxide-induced changes in Bay plant communities. They also will allow inferences to be made about the effects of the gas buildup on more complex ecosystems.

Blue Crab Ecology

The behavior and population dynamics of the blue crab, perhaps the most celebrated inhabitant of the Chesapeake Bay, have been the subject of intense study at the center. Working in the Rhode River, researchers documented a remarkable degree of habitat partitioning among crabs, segregating themselves according to size, sex, and molt stage.

New, young crabs that entered the river, or subestuary, in late fall and spring grew rapidly to more than 100 millimeters by the end of their first summer. By the end of their second year, the crabs matured, growing to 120–170 millimeters. Sixty percent of the crabs in the river basin were males. The sex imbalance in the population resulted from the late summer and early fall migration of females from the river, following maturation and copulation. Ninety percent of the medium-sized males molted while in the tidal river. Most crabs moving upstream were in the premolt stage, while those moving downstream tended to be larger and in postmolt.

SERC scientists also investigated how bottom-dwelling soft-shelled clams have been able to persist in low population densities, despite intense predation by blue crabs. With aquariums set up to mimic conditions in the Bay, the researchers evaluated whether crab foraging was influenced by the population density of the clams and by the composition of the sediment in the clams' habitat. They found that predation rates were significantly higher in muddy bottoms, resulting in marked up and down swings in clam population density. In sandy environments, however, predation rates increased up to a limit and then remained at that level. As a result, clam popula-

tions in sandy sediments persisted at low densities, reflecting actual conditions in the Chesapeake Bay. The results suggest that the foraging behavior of blue crabs and, consequently, mortality rates among the crustaceans' bottom-dwelling prey are strongly influenced by differences in microhabitat.

Sunlight Penetration

As it is in terrestrial ecosystems and in other aquatic environments, the availability of sunlight is a key determinant of productivity in the Chesapeake Bay. High concentrations of suspended soil particles and phytoplankton in the Bay act as barriers, attenuating incoming sunlight and confining it to shallow levels.

A SERC study of incident light and the depth of its penetration showed that, during times of clear water in the Rhode River, transmittance of light was similar to that previously reported for open ocean waters. High concentrations of suspended and dissolved materials, however, greatly attenuated incident sunlight and acted as a selective filter. Depending on the materials present in the water, some wavelengths of light essentially were blocked, whereas others were allowed to penetrate deeper into the water column. Attenuation in the upper part of the water column was higher under clear, sunny skies than under overcast conditions. Apparently, high concentrations of pigments and suspended particles on sunny days—due to the windier conditions on these days—increase light absorption and scattering. In addition, the diffuse light characteristic of cloudy days strikes at a less oblique angle than does direct sunlight over the course of a day. As result, diffuse light travels a shorter distance to reach a given water depth. Center researchers identified eight water quality parameters that account for 93 percent of sunlight attenuation under various sky conditions. The results will benefit efforts to model sunlight attenuation in turbid estuarine waters.

Nutrients in the Chesapeake Bay

The dynamics of how nutrients are introduced, processed, and recycled in the Chesapeake Bay are a long-standing and continuing interest of the center. In 1987, the center synthesized the results of studies it conducted over the last fifteen years, incorporating pertinent findings from other laboratories. This comprehensive body of

research can help guide efforts to improve the health of the nation's largest estuary.

For phytoplankton, which sit at the bottom of the Chesapeake Bay food chain, phosphorus, nitrogen, and silicon are the key nutrient elements. Algae, diatoms, and all other phytoplankton assimilate phosphorus only as dissolved orthophosphate, and silicon only as orthosilicate. They can assimilate nitrogen, however, as nitrate and several other forms. Thus, phytoplankton rely on other natural communities to break down more complex nutrient fractions into the simpler forms they require. During periods of rapid growth, when ample supplies of light and nutrients are available, algae contain fifteen to sixteen times more nitrogen than phosphorus. For diatoms, whose cell walls are made of silicon, the ratio of silicon to nitrogen is about 1 to 1.3. These so-called Redfield ratios may vary by a factor of up to 100 if light intensity or one or more nutrients are limiting.

Center studies also have documented considerable seasonal fluctuations in concentrations of nitrogen and phosphorus. During winter and spring, high ratios of nitrogen to phosphorus characterize the Bay's headwaters and those of its tributaries. As these waters move through the Bay to the Atlantic Ocean, their nitrogen content decreases more rapidly than their phosphorus content. During summer and fall, when riverine inputs are low, recycling of these nutrients by bottom-dwelling plants and animals helps replenish supplies of nitrogen and phosphorus. Concentrations of orthosilicate are usually high throughout the year, except in parts of the estuary that undergo diatom blooms in spring.

During an average year, land discharges account for 65 percent of the Bay's nitrogen inputs, 22 percent of its phosphorus inputs, and all of its inputs of biologically available silicon. Point sources, such as sewage pipes, account for 25 percent of total inputs of nitrogen and 73 percent of the phosphorus. Atmospheric deposition accounts for the remainder.

Recycling of nutrients within the water column and between the water column and bottom sediments and fringing marshes is a very dynamic process. The average nitrogen nutrient molecule, for example, is reused more than one hundred times during the course of a year. Much of the nitrogen and phosphorus recycling occurs within the plankton community in the water column, but silicon recycling occurs primarily in the bottom sediments.

Smithsonian Institution Archives

The Smithsonian Institution Archives (SIA) cares for the Institution's official records and for the papers of its curators and other staff members, as well as for the historical documents of various professional societies. Because the Smithsonian functioned as a central scientific agency in the United States until World War I, the SIA is a valuable primary source for the study of the history of science, particularly nineteenth-century American science. Other holdings document American art and social history. In addition to its stewardship of this vast collection of historical information, the SIA engages in research, trains archives managers, and regularly conducts surveys of records still held by the Smithsonian's bureaus and offices.

General Archival Program

A major records survey was completed this year in the Washington, D.C., office of the Archives of American Art (AAA). Representatives of both archives discussed transfers of records to the SIA and drafted an extensive records-disposition manual for the AAA. Another large survey was nearly completed in the offices of the U.S. Geological Survey (USGS) based in the National Museum of Natural History. SIA staff attended to details left over from last year's survey of the Freer Gallery of Art, and they met with representatives of the Freer and Sackler Galleries to discuss plans for an archival program. The SIA also completed a survey of records in the Office of Exhibits Central.

As part of the SIA outreach program, staff members surveyed the records of The Phillips Collection in Washington, D.C., and wrote a report to guide development of an archival and records-management program.

Among the important accessions in 1987 was the Mark H. Dall Collection, which contains additional material on William Healey Dall, explorer of Alaska and Smithsonian curator of mollusks. The SIA also acquired the papers of tick expert Harry Hoogstraal and those of Brooke Hindle and Robert P. Multhauf, emeritus senior historians of the National Museum of American History.

The SIA made significant additions to its historical records of professional societies, receiving collections from the American Association of Museums, American Society of Mammalogists, and Society of Vertebrate Paleontology. The SIA also acquired the records of the USGS Paleontology and Stratigraphy Branch, as well as a large collection of field maps from the U.S. Fish and Wildlife Service facility at the Patuxent Wildlife Refuge in Maryland.

Reference Service

SIA staff members responded to more than sixteen hundred reference inquiries in 1987 and furnished more than fifty-five hundred items and some twenty-seven thousand copies to researchers. Much staff time was devoted to aiding researchers working on a Smithsonian Books volume on expeditions, which is being written by Dr. Herman Viola, director of the Quincentenary Program of the National Museum of Natural History. Considerable assistance was also given to Dr. Sally Gregory Kohlstedt, Syracuse University, who is studying natural history museums.

The ongoing tally of publications based in part on SIA research and materials increased by a record number in 1987. These publications included *Theodore Roosevelt, Culture, Diplomacy, and Expansion: A New View of American Imperialism*, by Richard H. Collin (Baton Rouge: Louisiana State University Press, 1985); "William Rich of the Great U.S. Exploring Expedition and How His Shortcomings Helped Botany Become a Calling," by Richard H. Eyde, in *Huntia* 6(2) (1986); and "The Development of the National Museum at the Smithsonian Institution, 1846-1855: A Response to Joel J. Orosz's Article," by S. Dillon Ripley and Wilcomb E. Washburn, in *Museum Studies Journal* 2 (1987).

The Archives continued its lecture series, "Research in Progress." Visiting researcher Richard Beidleman of Colorado College discussed Charles Darwin and his work in Australia, and Alan R. Hardy, insect biosystematist at the California Department of Food and Agriculture, gave a lecture on John Lawrence LeConte. Mike Foster, a freelance writer from Colorado, discussed F. V. Hayden's development as a naturalist, and Sally Gregory Kohlstedt spoke on past Smithsonian Assistant Secretary George Brown Goode's role as a historian of American science.

Projects

The Smithsonian Oral History Project made considerable progress in 1987. Completed and transcribed interviews of Institution administrators and scholars raised the collection total to 302.5 hours of recording, accompanied by forty-nine hundred pages of transcripts. The project benefited from the participation, for the first time, of University of Maryland graduate students, who recorded interviews of bureau staff members.

Work on "Science in National Life," a video history program funded by a grant from the Alfred P. Sloan Foundation, began in earnest in 1987. The program supports the efforts of Smithsonian historians and curators to document the history of science and technology through the use of videotape. These scholars produced forty-two hours of original videotaped interviews from five projects—on topics ranging from the history of mini- and microcomputers to a study of early X-ray astronomy and aeronomy. Additional videotaping by the Archives' oral historian documents the career of G. Arthur Cooper, Smithsonian curator emeritus of paleobiology.

The SIA's ongoing survey of the Institution's photographic collections was highlighted by the completion of work in the National Museum of Natural History. Surveying continued at the Archives of American Art and was begun at the National Portrait Gallery. By the year's end, the total number of collections surveyed since the inception of the project stood at about fifteen hundred; these collections contain more than 6.5 million photographs. Reports describing the collections exceeded a total of seven thousand pages.

In tandem with this activity, members of the survey project completed and submitted for peer review a 117-page glossary of terminology describing photographic processes, forms, and genre. In addition, the *Finders' Guide to Photographic Collections at the Smithsonian Institution: National Museum of American History* was completed, and work progressed in the preparation of the second and third *Finders' Guides*—for the natural science bureaus and art museums. The staff also assisted more than one hundred photo-collection managers and curators from Smithsonian bureaus and outside organizations in solving reference, management, and conservation problems involving audiovisual resources. A grant from the Women's Committee of the Smithsonian Associates enabled members of the project and the SIA historian to prepare and conduct a two-part seminar on preserving and managing videotape, audiotape, film, and photographic materials. Featuring speakers from the Library of Congress, National Archives, and Smithsonian, the seminar advised staff members from various offices on the care of their resources.

In a related project, 16-millimeter films that document work of the Smithsonian Tropical Research Institute during the 1950s were transferred to videotape. Transfer of the films, which were donated by former Smithsonian Secretary Alexander Wetmore, was supported by a grant from the Atherton Seidell Endowment Fund.

Exhibitions

The Archives made two major loans from its collections in 1987. Owen G. Warren's drawings of proposed plans for the Smithsonian Castle were loaned for exhibition in the Regents Room. Architectural drawings by Warren, James Renwick, and John Notman were loaned to the National Building Museum in New York for display in the IBM Gallery of Science and Art as part of the exhibition "Building a National Image: Architectural Drawings for the American Democracy, 1789–1912."

The SIA also presented two new exhibitions during the past year. "The J. Victor Carus Photograph Album" featured photographs of Charles Darwin and other naturalists. In "The Harriman-Alaska Expedition, 1899," the photographs of Edward S. Curtis were displayed, along with some of the specimens collected by Robert Ridgway and William Healey Dall.

Two new numbers in the archives' Guides to Collections series were published in 1987. James A. Steed wrote the *Guide to the Records of the Office of the Secretary (Charles D. Walcott), 1890–1929*, and William E. Cox was the author of the *Guide to the Paul D. Hurd, Jr., Papers, 1938–1982*.

J. R. Patterson and the skin of a grizzly bear killed by him in Arizona, 1922. This photograph was found when the Smithsonian Institution Archives recently processed the papers of Hartley H. T. Jackson of the Bureau of Biological Survey.



Smithsonian Institution

Libraries

As keeper and manager of collections totaling nearly one million volumes, including twenty thousand journal titles and twenty-five thousand rare books, Smithsonian Institution Libraries (SIL) supports the Institution's research and curatorial activities and its public education programs. Through continuing involvement in the creation of a national bibliographic data base and further refinement of its own automated system, the SIL has greatly increased its utility and accessibility to researchers inside and outside the Smithsonian. The SIL serves the general public through reference, loan, and other information programs and through publications, exhibitions, and lectures.

SIL services are available through a network of fourteen branch libraries housed at thirty-six locations—in Washington, D.C., and the surrounding area; New York City; Cambridge, Massachusetts; Mount Hopkins, Arizona; and Panama. The performance of the SIL staff at branches and central service units is enhanced through the contributions of sixty-nine volunteers, twelve stay-in-school employees, and four student interns.

A member of the Association of Research Libraries, the SIL consists of three operational divisions and a Planning and Administration Office. Notable developments during the past year include a grant from the Atherton Seidell Endowment Fund to support the documenting of astronomical data analysis systems, a project begun in 1986 by the branch at the Smithsonian Astrophysical Observatory. Planning began for the final stages of the renovation of the libraries' central offices. In addition, the SIL added three telefacsimile machines to enhance communication and interlibrary loans among branches. Highlights of SIL's three divisions and its public education programs are presented below.

Automated Systems

The SIL continued to exploit the advantages of electronic technologies in applications ranging from information and resource sharing on an international basis to routine administrative tasks. The Automated Systems Division furthered development of the Smithsonian Institution Bibliographic Information System (SIBIS), bringing the division closer to its goal of creating a fully integrated data base that encompasses all of the libraries' vast holdings. To this end, the division is gradually replacing all card and microform catalogues, circulation files, and other paper files with a single source of bibliographic information that can be updated continuously and accessed from any-

where in the Institution. The on-line catalogue, in combination with sophisticated search mechanisms, spares researchers the circuitous, sometimes fruitless quests for bibliographic information. Though not fully completed, SIBIS is so heavily used by Smithsonian staff and outside researchers that the SIL added more dedicated terminals to the system in 1987, and it increased the number of telecommunication links.

Complicated by various changes in the location of collections, conversion of bibliographic records to the computerized system—carried out by SIL staff, volunteers, and outside contractors—is nearly finished. Moreover, the backlog of uninventoried and uncatalogued items is steadily decreasing. In 1987, the SIL began cataloguing the 8,650 gift items stored at the SIL Remote Annex. This rich trove of materials had largely been inaccessible to researchers because of the lack of a catalogue or index. In addition, the SIL supplemented in-house cataloguing of some nine thousand uncatalogued rare books in the SIL Special Collections by contract cataloguing. Among other uncatalogued materials is a collection of about 230,000 pieces of trade literature. This collection of retail catalogues for such goods as seeds, furs, and auto parts is one of the largest of its kind and represents an important information source for studies of the history of American commerce. Because of the vastness of this important body of materials, however, cataloguing efforts, as well as implementing measures to ensure physical access, are fraught with logistical problems. An indexing method devised by the Automated Systems Division should overcome these obstacles and could serve as a model for handling trade literature at other libraries.

In tandem with these efforts, the division began detailed planning for an on-line automated circulation system. Debuting in 1988, the system will provide detailed inventory and tracking information on all items in SIL collections. As part of this effort, bar-code identifiers, which can be read and recorded on computer with optical scanning equipment, were generated for more than 450,000 volumes. Further enhancements of SIBIS, such as an on-line authority control of names and subjects, will be implemented in 1988.

The division also planned and installed a local area network that links, by means of computer, the units within the SIL central administration and integrates all computer-aided tasks. Coordination of all SIL activities was strengthened by an Electronic Mail System. Introduced in 1986, the system allows the branches and central offices to communicate electronically, greatly improving efficiency.

Electronic technology has fostered greater cooperation between the SIL and other libraries, a relationship that directly benefits Smithsonian researchers through broader access to bibliographic materials. The SIL continued to be an active participant in the Online Computer Library Center (OCLC), an international bibliographic data base involving more than six thousand libraries. In 1987, the division took a major step toward standardizing its headings to match those of the Library of Congress. Using a tape of all SIL holdings, a company that specializes in bibliographic services is categorizing Smithsonian headings according to Library of Congress headings of names and subjects. The resulting cross-reference system will increase access to SIL collections. Finally, the division prepared a computerized listing of the libraries' museology holdings for inclusion in the computerized data base of the International Council of Museums (ICOM) in Paris.

Research Services

In 1987, six of the fourteen branches that make up the Research Services Division either moved, were consolidated, or underwent other major physical changes that entailed rearranging entire collections, or at least substantial portions of them. The Museum of African Art Branch moved from its Capitol Hill location to its new location on the National Mall. With the closing of the Smithsonian Environmental Research Center's Rockville Branch, new homes had to be found for the branch's collections throughout the Institution and at the SIL Remote Annex. Three branches—the Museum Reference Center, Office of Horticulture, and main location at the National Museum of Natural History (NMNH)—underwent renovation and expansion. Finally, window repairs at the Cooper-Hewitt Museum Branch made it necessary to rearrange the collection in the rare-book room.

Each project was preceded by weeks, sometimes months, of careful planning that tracked the moves of each and every volume in a collection. Expansion of the NMNH Branch, for example, entailed integrating more than 125,000 volumes that had been housed at three sites. With the exception of the natural history and African art collections, division staff not only attended to organizational details but also provided the considerable physical labor required to move the books.

Similar exercises are in store for the division. Branches of the National Air and Space Museum and the National Museum of American History are planning changes that will require moving large portions of their collections.



Smithsonian Institution Libraries reception for "Nota Bene," an exhibition celebrating the tenth anniversary of the opening of the Dibner Library, Special Collections Branch, in October 1986. Secretary Robert McC. Adams with Dr. and Mrs. Bern Dibaer.

The Smithsonian Astrophysical Observatory Branch is about to reorganize holdings at its site in Cambridge. In addition, the planned transformation of the SIL Remote Annex into a working branch will necessitate a major investment of brain and brawn.

Installation of computers at a number of branches has improved operations, expediting searches for materials, responses to reference inquiries, collection and analysis of statistics, and preparation of internal reports. Branch-to-branch communications on the Electronic Mail System have also contributed to smoother operations.

In 1987, the division launched a final, concerted effort to reclaim the more than one thousand items borrowed from the Library of Congress before 1984. By the year's end, some 660 of these items had been located and retrieved from curatorial offices, the shelves of the SIL, and the stacks of the Library of Congress itself. Negotiations with Library of Congress administrators will determine actions in regard to unrecovered volumes.

With support from the Research Opportunities Fund, two Research Services librarians participated in international conferences and cooperative bibliographic projects.

Katharine Martinez, chief of the Cooper-Hewitt Branch, presented a paper on the Smithsonian art libraries to the annual conference of the International Federation of Library Associations in Brighton, England. Joyce Rey-Watson, chief of the Smithsonian Astrophysical Observatory Branch, assisted in preparing a new English-version manual for Sets of Identifications, Measurements, and Bibliography for Astronomical Data (SIMBAD), a creation of France's Strasbourg Observatory. At a conference on "Astronomy from Large Data Bases," hosted by the Space Telescope-European Coordinating Facility at Garching-bei-Munchen, West Germany, Rey-Watson reported on "Access to Astronomical Literature through Commercial Databases." She also discussed an ongoing project to collect software documentation specific to astronomical data at the Smithsonian Astrophysical Observatory Branch.

While on part-time leave from the SIL, Ellen Wells, chief of the Special Collections Branch, has been conducting research for a bio-bibliography of James G. Wood, prominent popular writer on natural history in late nineteenth-century England.

Collections Management

The Collections Management Division began implementing recommendations of the final report of the SIL Preservation Planning Program. The report, issued in 1986, highlighted the fact that nearly one-third of the libraries' general collections (items not housed in rare-book facilities), including more than 90 percent of volumes published between 1870 and 1930, are severely deteriorated. It emphasized the need to devote more resources to preserving the general collections.

The division is recruiting a preservation specialist to devise and administer procedures and policies to guard against further damage. To safeguard collections at the SIL Remote Annex, drywall and air-conditioning are being installed; and to protect newly purchased volumes, the division increased funding for binding paperback and serial books. More than ten thousand volumes were bound in 1987.

Many volumes in the SIL collections are too brittle to rebind or repair. The only preservation option is to convert the contents of these books to microform or another stable medium. This work will soon be under way. The SIL solicited contract proposals for producing a microform collection of volumes relating to international expositions that were published between 1850 and 1917. The contract also calls for the production of a bibliographic

guide to the microform collection. The SIL began evaluating the proposals as the year drew to a close.

In 1987, the division's Book Conservation Laboratory was selected as host for a Postgraduate Conservation Intern. Sponsored by the Smithsonian's Conservation Analytical Laboratory, the intern will begin work at the SIL in fall 1987. During the past year, the Book Conservation Laboratory hosted interns from Colombia and Israel.

Public Programs

The tenth anniversary of the Smithsonian's Dibner Library, a collection of rare books on the history of science and technology, was celebrated with the exhibition "Nota Bene." The display of twenty-nine books spanning 443 years featured volumes notable for their historical significance and for the curious annotations readers inscribed in margins and flyleaves. The exhibition was a fitting commemoration of the Burndy Library's donation of more than ten thousand rare books—including three hundred incunabula, or volumes printed before 1501—and some sixteen hundred manuscripts. The books and manuscripts were collected by Dr. Bern Dibner, a Connecticut inventor and entrepreneur.

The Dibner Library featured two additional exhibitions in 1987. "Aristotelian Science in the Dibner Library" displayed manuscripts and early printed books on the natural philosophy of Aristotle and his followers. As part of the exhibition, Professor William A. Wallace, of the Catholic University in Washington, D.C., gave a lecture entitled "The 'Wheel of Aristotle' in Guevara and Galileo." "Classics of Physiology," the third exhibition in the Dibner Library, commemorated the hundredth anniversary of the founding of the American Physiology Society, which cosponsored the exhibition with the SIL.

Another exhibition celebrated the tenth anniversary of the SIL Book Conservation Laboratory by illustrating traditional methods of binding and book repair and modern ultrasonic techniques. In addition, the SIL sponsored a panel discussion, "Books from the Attic: What Are They Worth?"

As part of its mission to support the full range of Smithsonian activities, the SIL loaned more than seventy rare books and manuscripts to the National Museum of American History for its exhibition "Isaac Newton and the *Principia*: Three Hundred Years."

Publishing, translating, and other scholarly activities punctuated SIL programs in 1987. With the American Cut Glass Association, SIL copublished a facsimile *L.*

Smithsonian Tropical Research Institute

Straus and Sons Richest Cut Glassware, which was originally printed in 1893. A new library guide for the Museum of African Art Branch was published for the September opening of the new museum complex. The SIL also published the brochure "Gift Information for Donors." The SIL Translation Publishing Program received eight translations for scientific editing, returned five edited manuscripts for printing, and placed orders for six new translations. Copies of 149 previously published translations were distributed to scholars.

SIL staff members participated in a variety of professional meetings and published numerous articles and book reviews. Visitors to the Libraries in 1987 included librarians from the Consortium of Universities of the Washington Metropolitan Area, the People's Republic of China, Indonesia, Japan, and Chile, as well as students from the Institute of Federal Library Resources, Catholic University, and Kent State University.

Staff Changes and Appointments

Vija L. Karklins was named SIL acting director in October, when Robert Maloy assumed the position of senior historian. Maloy spent the year doing research on medieval manuscripts in Lyons, France. Frank Pietropaoli, chief of National Air and Space Museum Branch, retired in February and was succeeded by Martin Smith. Maureen Canick was appointed chief of Central Reference and Loan Services, and Pauline T. Lesnik reported for duty as chief of Acquisitions Services in September. Silvio A. Bedini retired from his position as special assistant to the director after twenty-six years of service to the Institution.

Just as favorable economic conditions can support more elaborate human civilizations, favorable tropical climates allow organisms more ways of life, more elaborate relationships between predators and prey, and more intense and ingenious forms of competition for food and mates. The adaptations of organisms are most elaborate, most varied, and most obvious in tropical habitats. Understanding the roles, adaptations, and interdependencies of tropical organisms still provides, as it did for Darwin and Wallace, a perspective essential to understanding the natural world as a whole and the appropriate role of humans therein.

The Smithsonian Tropical Research Institute (STRI) is devoted to understanding tropical nature, to sharing this knowledge, and to helping in the preservation of tropical ecosystems. To this end, STRI is steward of the fifty-four-hundred-acre Barro Colorado Nature Monument, comprising Barro Colorado Island, a forested island in Gatun Lake in the middle of the Panama Canal, and surrounding peninsulas. The institute and the tropical forest reserve in its care are unparalleled in two respects. No other tract of tropical forest has been studied in such great detail, and STRI offers premier facilities to support continuing research.

In addition, the institute is ideally located for comparative studies of the Atlantic and Pacific oceans, separated only three million years ago. The environments of the two oceans are very different, but they contain remarkably similar stocks of organisms.

With its experienced research staff, its financial support for predoctoral and postdoctoral students—some reserved specifically for students from developing countries—and its excellent library and laboratories, STRI is a major world center for tropical research. The accounts below describe some of the institute's research and education activities in 1987.

The Mechanics of Natural Selection

Biological organization is the product of natural selection—the differential reproductive success and survival of populations of organisms. Knowledge of the complex process of natural selection is key to understanding the dynamics of individual species and of the relationships between species.

Consider the relationship between plasmids—small self-replicating circles of genetic material—and their bacterial hosts. Although capable of autonomous replication inside their host, plasmids sometimes insert themselves

into the chromosomes of bacterial cells and are copied along with the bacteria's normal complement of genes. William Eberhard, STRI biologist, has been reviewing current knowledge of this biological relationship to determine, among other things, when plasmids act as destructive parasites and when they are useful to their host. He has found that plasmids often contain genes that yield advantages to bacteria in unusual circumstances, such as conferring resistance to certain man-made drugs.

Natural selection also is manifested through competition for mates or sexual selection. STRI biologist A. Stanley Rand has resumed his study of the mechanics of sexual selection among tungara frogs. Males in this species use a two-part call—a “whine” followed by one or more “chucks”—to attract females. Rand has found that females prefer males with deep voices, regardless of the callers' body size. Another aspect of female preference poses a risk to suitors. Females are more attracted to calls with chucks, but so are predatory bats. In a related study, Andrew Green, a STRI short-term fellow, is investigating the relationship between the amount of time males spend feeding and the amount of time they devote to calling for females.

Mate choice and reproductive behavior in *Zygopachylus*, a species of “daddy longlegs” (opilionid), is the research focus of Giselle Mora, STRI predoctoral fellow. The species is unique within this group of spiders because males guard the eggs after females lay them on male-made nests. Some nests attract many more females than others, but in nests with only a few eggs, males will often drive away prospective mates, sometimes with the aid of the female that had laid the eggs. Mora seeks to determine whether this behavior is an example of evolving (or, perhaps, dissolving) monogamy.

Institute biologist Mary Jane West Eberhard is investigating whether sexual selection can also result in the evolution of a new species without geographic isolation. She is studying parasitic ants that live and feed in the colonies of a very closely related species of nonparasitic ants. Among the differences between the two species is the smaller size and less aggressive nature of queens in the parasitic species. West Eberhard is examining whether this size difference accounts for the emergence of the parasitic species. Ant queens tend to mate with males of roughly equal size. Thus, small males in the host ant species probably do not join the mating flights of large females because of their size disadvantage. According to West Eberhard's hypothesis, the smallest reproductive females also may remain in the nest and mate with small males. These mating preferences may have favored the

evolution of a reproductively isolated strain of small parasites. If this can be demonstrated, it would be one of the few documented instances in which geographic isolation did not play a role in speciation.

Competition

The biology of understory herbs illustrates the intensity of competition in tropical forests. Alan Smith, STRI biologist, found that when a canopy tree falls, reproduction of understory herbs increases dramatically, beginning one year after the “window of light” was created in the canopy. The prolific spurt is short-lived, however. Within four years, tree regrowth reduces the amount of light reaching the forest floor to normal levels. A year later, according to Smith's study, reproduction of understory herbs also returns to normal levels. The availability of light is the main factor affecting the growth of the understory plants. Smith found that irrigating the plants during the dry season had little effect when sunlight was intercepted by their taller competitors.

Predation and Its Effects

By necessity, many aquatic and terrestrial organisms in tropical ecosystems have developed particularly elaborate “strategies” to avoid the nearly constant threat of predation. STRI postdoctoral fellow Hugh Sweatman has been studying the behavior of a lizardfish, *Synodus synodus*, and of its prey, two species of goby. Sweatman is using a lifelike replica of a lizardfish to learn how the goby avoid their predator. One goby species gives an alarm signal when a lizardfish is nearby. The likelihood of this response increases as the predator moves closer—unless the lizardfish is so near that the potential victim becomes motionless—and as the goby gets closer to its hiding place. On the basis of his observations, Sweatman infers that the goby uses the alarm as a signal to the lizardfish that it is aware of the predator's presence and can escape if pursued. Although the other goby species also has the same signal in its behavioral repertoire, Sweatman found no correlation between the presence of the lizardfish and the goby's use of the signal as if the signal's function had changed.

Sometimes timing makes the difference between survival and falling victim to a predator. The larvae of intertidal crabs, for example, generally hatch when they are in the least danger of being eaten. In a study of hatching



Smithsonian Tropical Research Institute Director Ira Rubinooff making a presentation on the institute's marine research programs at a field station in the San Blas Archipelago during the Kuna General Congress, May 2, 1987, Isla Tigre.

patterns in the Pacific Ocean and Caribbean Sea, staff biologist John Christy and STRI postdoctoral fellow Steve Morgan found that two major crab groups hatch at dusk. On the Pacific side, where tides are regular and of wide amplitude, the larvae of these crabs tend to hatch fortnightly on strong spring tides that effectively flush them to sea. On the Caribbean side, where tides are irregular and weak, this fortnightly pattern is poorly developed.

On Barro Colorado Island, Mitchell Aide, STRI postdoctoral fellow from the University of Utah, and Cybele Londoño, STRI Exxon fellow, have shown that rapid growth helps protect *Gustavia superba* from caterpillars of the skipper butterfly *Enteus priassus*. Leaves of un-

derstory *Gustavia* grow to full size in a week, three times faster than most species. The nitrogen content of the expanding leaves is double that of other plants, fostering rapid growth but also making the young foliage unusually nutritious and attractive to herbivores of all kinds. Skippers lay eggs on young buds and growing leaves. Most eggs hatch on the day the leaf is fully expanded, or the day before. Fully expanded leaves, however, are too tough for the new caterpillars, and many die.

Plants of the euphorb genus *Omphalea* have developed a different means of protection, a biochemical defense to keep leaf-eating insects at bay. A research team consisting of STRI's Neal Smith and collaborators from England's Kew Gardens and the University of California at Irvine

discovered that *Omphalea* makes compounds that mimic the sugars glucose, fructose, and mannose. The feet of many insects contain sugar-processing enzymes, and the plant's compounds block the enzymes, forcing insects to cease their eating or egg-laying. Day-flying uraniid moths are an exception, however. *Urania* caterpillars feast on *Omphalea* leaves and sequester the plant's enzyme-blocking compounds. STRI research suggests that the compounds protect the larvae from insect predators, although the chemicals do not dissuade vertebrate predators. The research also exposed an interesting twist in the moth-plant relationship. After one or more defoliations, *Omphalea* plants somehow repel *Urania*. The mechanisms responsible for this defense response are under investigation.

Disrupting the balance between prey and predators can have community-wide consequences. In 1980, hurricane Allen devastated coral reefs on the north coast of Jamaica. Nancy Knowlton of the STRI staff has been monitoring subsequent changes. Populations of snails, polychaete worms, damselfish, and other coral predators did not decline. Feeding by these organisms has further depleted reef-coral populations, especially those of *Acropora cervicornis*. The nearly complete demise of long-spined sea urchins (*Diadema*), the result of an outbreak of disease in 1983, has aggravated the problem. Because there are not enough urchins to keep them in check, algae are overgrowing and "smothering" coral. According to Knowlton's measurements, algae now cover 90 percent of some quadrats (squares of vegetation randomly chosen for analysis), and live coral cover only 5 percent.

Herbivores can also exert community-wide influences in forests. STRI biologist Stephen Hubbell has completed two successive censuses of stems more than 1 centimeter in diameter on a 50-hectare plot in Barro Colorado's mature forest. He has found that if the nearest neighbor of a sapling with a stem diameter of 1–4 four centimeters is a canopy tree of the same species with a trunk diameter of 30 centimeters, the sapling grows more slowly and is less likely to survive the year than if it were next to a tree of a different species. This finding suggests that plant-eating insects and animals help maintain tree diversity. By consuming saplings near the parent trees, specialist herbivores create space for trees of other species to grow between parents and their surviving offspring.

Hubbell's finding, however, does not apply to all species. Audrey Liese, a short-term fellow, and S. Joseph Wright, a STRI staff member, found that soil microbiota from beneath the parent plant enhances the growth of *Calophyllum longifolium* seedlings. In contrast, soil from

a different *Calophyllum*, as well as sterilized soil from beneath the parent tree, did not promote growth.

Seasonal Rhythms of Tropical Plants

A study by postdoctoral fellow Mitchell Aide suggests that herbivores may have helped shape the seasonal rhythms of the tropical forest. He found that, in the understory, many species of shrubs and saplings less than 3 meters tall produce new leaves during the first third of the dry season. The plants leaf again in April and May, the first two months of the rainy season, and then shut down production until September. Herbivore damage is greatest during the rainy season, and leaves produced at the end of the rainy-season peak are more heavily eaten than those produced in April. The opposite is true during the dry season: Leaves produced near the end of the season suffer less damage than earlier growth, because, perhaps, many insects cannot tolerate the heat and drought of the late dry season. Aide's observations suggest that leaf production in the dry season may be an evolutionary response to the seasonal rhythm herbivory.

In a novel irrigation experiment, S. Joseph Wright has been working to identify the factors that govern the timing of leaf production, leaf drop, and flowering. On two 2.25-hectare plots on Barro Colorado Island, Wright kept the soil saturated through two successive dry seasons. Despite the dramatic environmental change, the leafing and flowering patterns of most tree species did not change. *Tabebuia guayacan* was the most notable exception. Under normal conditions, the species is leafless during the dry season and flowers in response to dry-season rains. During the irrigation experiment, however, the tree held on to its leaves into the normal rainy season and flowered branch by branch in July, with different branches out of phase.

Fluctuation, Variation, and Disruption

To assess the susceptibility of natural populations to human disturbances, it is important to understand how and why these populations vary in the absence of human disturbances.

In the San Blas Islands, institute staff member Ross Robertson has been monitoring fluctuations in populations of gobies. The small coral-reef fish had been abundant, with population densities of up to fifty animals per square meter. Robertson documented a 95 percent drop

in goby populations over a six-month period. Failure of larval goby to survive in plankton interrupted recruitment of young fish. No young settled on the reef for four months, an unusually long break in recruitment. Robertson did not find corresponding interruptions in the recruitment of other species of coral-reef fish.

Since Barro Colorado was formed in 1913 as a result of damming the Chagres River during the construction of the Panama Canal, several bird species have disappeared from the island. James Karr, STRI's deputy director, has been evaluating characteristics of the species that might account for their absence from the island. Among understory birds of the nearby Parque Nacional Soberania on the Panama mainland, the annual survival rate (61 percent) for species still present on the island was significantly higher than the rate for species no longer represented there. Karr also has determined that the species with the lowest survival rates on the mainland are those that were the first to disappear from the island.

STRI scientists also are evaluating the impacts of a major human-caused disturbance—an April 1986 oil spill near Galeta, site of the institute's mainland marine station on the Caribbean. With support from the U.S. Department of Interior, a research team led by STRI's Jeremy Jackson is analyzing the spill's effect on populations that inhabit the reef flat at Galeta and on organisms in adjacent habitats exposed to varying concentrations of oil. The scientists will compare these documented responses to population changes attributed to "natural" disturbances, as determined in STRI studies conducted over the past thirteen years. From core samples of corals, which live for centuries and lay down annual rings, the team will also compare the impact of the oil spill on coral growth rates with other fluctuations in growth rates during the past few hundred years.



Jacqueline Idol, research assistant at the Smithsonian Tropical Research Institute, taking photographs of the forest canopy on Barro Colorado Island. Computer analysis of these photographs provides accurate data on forest light environment—an important aspect of ecophysiological research on the island.

Archaeology and Paleoecology

The institute's research in archaeology and paleoecology (the study of ecological conditions during early geological times) reveals long-term environmental changes and their impact on ecosystems. For example, core samples obtained by drilling into the bottom of La Yeguada, a lake that sits 600 meters above sea level in Veraguas, reveal remarkable climatic variations. Two of the four cores, taken by STRI's Richard Cooke, working with Dolores Piperno, Temple University, and Mark Bush, Ohio State University, reached bedrock after penetrating through 18

meters of sediment. The oldest of these sediments formed 12,800 years ago.

Analyses of pollen and plant fossils indicate that local vegetation from about 9000 B.C. to 7000 B.C. was dominated by oaks (*Quercus*) and hollies (*Ilex*). These remnants suggest a cool, damp climate, because today such plants are found at altitudes above 1,500 meters. Sediment samples also indicate that after 7000 B.C. the climate was much drier than it is today. Evidence of burning by humans appears at 6000 B.C. and evidence of agriculture by 4000 B.C. These dates accord with conclusions from other studies of Panama and South America.

In another study, STRI biologist Jeremy Jackson and Peter Jung, University of Basel, Switzerland, have been surveying Panama's marine fossils that date back to the Neogene epoch, which began twenty-six million years ago. They have found amazing local variation in the faunas and evidence of extremely high sedimentation rates. There is much to learn about the impact of the rise of the Isthmus of Panama on marine life.

Mediating between Man and Nature

A major concern of the institute is the restoration of damaged environments. Gilberto Ocaña of the STRI staff is experimenting with ways to make degraded pastureland useful on a sustainable basis. Three years ago, he planted four hundred leguminous trees (*Gliciridia sepium*) on a 1-hectare plot of otherwise useless land, and interplanted among them kudzu vines, manihot, bananas, and other plants. Ocaña calculated that his experimental plot can support twenty-four goats, each one producing an average of 156 liters of milk per year. In addition, the nitrogen-fixing trees and vines supply enough of the vital nutrient to sustain the growth of other crops. This form of agriculture could eliminate the need to burn and clear new land for farming, relieving some of the development pressure on Panama's forests.

Another ongoing project, led by STRI visiting scientist Dagmar Werner, has similar aims. Werner has been raising iguanas in captivity, adjusting dietary and rearing conditions to improve their growth rates. Iguanas are a favorite food in many parts of Panama, but hunting and tree-cutting are threatening the animals' survival. The STRI scientist has released two thousand ten-month-old iguanas in gallery forest of Coclé province and fifteen hundred hatchlings into gallery forest at Chupampa in Herrera province. With the help of local farmers, Werner has established feeding stations for these iguanas. The effort appears to be a success. Werner's evaluations indicate that survival rates for the introduced animals are higher than they are for wild iguanas studied on Barro Colorado Island.

Education and Conservation

The Smithsonian, Exxon Corporation, Jessie Smith Noyes Foundation, and other donors continued to provide support for STRI's fellowship and assistantship programs. This funding allowed more than ninety men and

women from North America, Europe, Asia, and Latin America to pursue their own studies or participate in ongoing research projects at the various STRI facilities. The institute's educational program was strengthened in 1987 with the creation of a three-year postdoctoral position in tropical forest biology.

Characteristic of the ongoing cooperation between the institute and the University of Panama is the new joint course on bryophytes and lichens under the direction of Dr. Noris Salazar, a university specialist in bryophytes. The course fills a gap in the university's curriculum and will foster greater knowledge of Barro Colorado Island's flora. One product of the course will be a guide to the island's mosses and liverworts.

As part of the institute's public education program, initiated in 1986, STRI staff members made presentations to civic groups, students, and professional associations. The new "Barro Colorado Nature Trail Guide," also designed for the general public, has received high praise from educators and conservationists and is used extensively by students and other visitors to the island. To increase its educational value, the guide was translated into Spanish.

For nine months, Jorge Ventocilla, STRI environmental specialist, and Rosa Argelis Ruiz de Guevara, of STRI's Naos Marine Laboratory, carried out an extensive environmental education program in the Kuna Yala (San Blas) Archipelago, a string of islands along Panama's Caribbean coast inhabited by thirty thousand Kuna Indians. The pair visited more than seventy communities, traveling from island to island in a 10-foot-long dugout canoe. At each site, Ventocilla and Guevara presented a two-hour slide show and distributed posters and pamphlets specially prepared for the program and partly funded by the Women's Committee of the Smithsonian Associates. The aim of this program was to explain to the Kuna Indians the presence of STRI on the archipelago, the value of basic marine research, and how the resulting information can be used to help preserve their environment, now under intense human pressure. In 1987, the institute and the Kuna General Congress signed an agreement that formalizes STRI research in archipelago waters.

Other Activities

In a private ceremony, STRI Director Ira Rubinoff received the National Order of Vasco Nunez de Balboa from the Panamanian minister of health. The honor recognizes Rubinoff for his "excellent research work . . .

converting STRI into the most well-known center of marine research in the tropics . . . contributing with genuine interest in the establishment of important fellowship programs, travel grants, and work for young Latin American scientists.”

Also in 1987, STRI and two other Panama-based organizations were charged with organizing the 1992 World Congress of National Parks. The International Union for Conservation of Nature designated Panama the 1992 site to commemorate the five hundredth anniversary of Columbus's first voyage to the New World.

The institute continued to contribute to the work of local organizations. It presented a set of “Diversity Endangered” materials to Fundacion PA.NA.MA., a conservation consortium, and gave a poster exhibit, “Black Women: Achievements against the Odds,” to the Afro-Antillean Museum of Panama's National Institute of Culture. In addition, STRI special assistant Elena Lombardo serves on the board of directors of Panama's new Metropolitan Nature Park. The institute awarded several small grants to support surveying of indigenous plants and birds and to aid development of a nature trail.

Director Ira Rubinoff traveled to the Forest Research Institute in Malaysia, with the aim of strengthening ties and, ultimately, establishing a cooperative scientific agreement between the two institutes. STRI continues to assist scientists in several countries with the development of forest census plots like the one on Barro Colorado Island.

The institute also remained active in its role as an adviser in efforts to develop biological-inventory and environmental-assessment programs that will be initiated by the Trinational Canal Alternatives Study Commission.

Facilities Development

Groundbreaking ceremonies for the Tupper Research and Conference Center took place on April 3, 1987, attended by David Challinor, Smithsonian assistant secretary for research, the president of Panama, and representatives from many Panamanian agencies. Initiated with a \$4 million grant from the Earl Silas Tupper Foundation, the center will permit consolidation of the institute's terrestrial programs and provide modern facilities for planned projects in molecular evolution and plant physiology. The facility will be completed in late 1988.

A new dormitory was completed in Gamboa. The eight apartments in the unit will make it easier for researchers to conduct studies in the adjacent Parque Nacional Sob-

erania. Finally, marine research facilities were substantially improved with the renovation of the old Surfside Theatre building on Naos Island. The facility provides office and laboratory space for scientists working on the Galeta oil spill project.

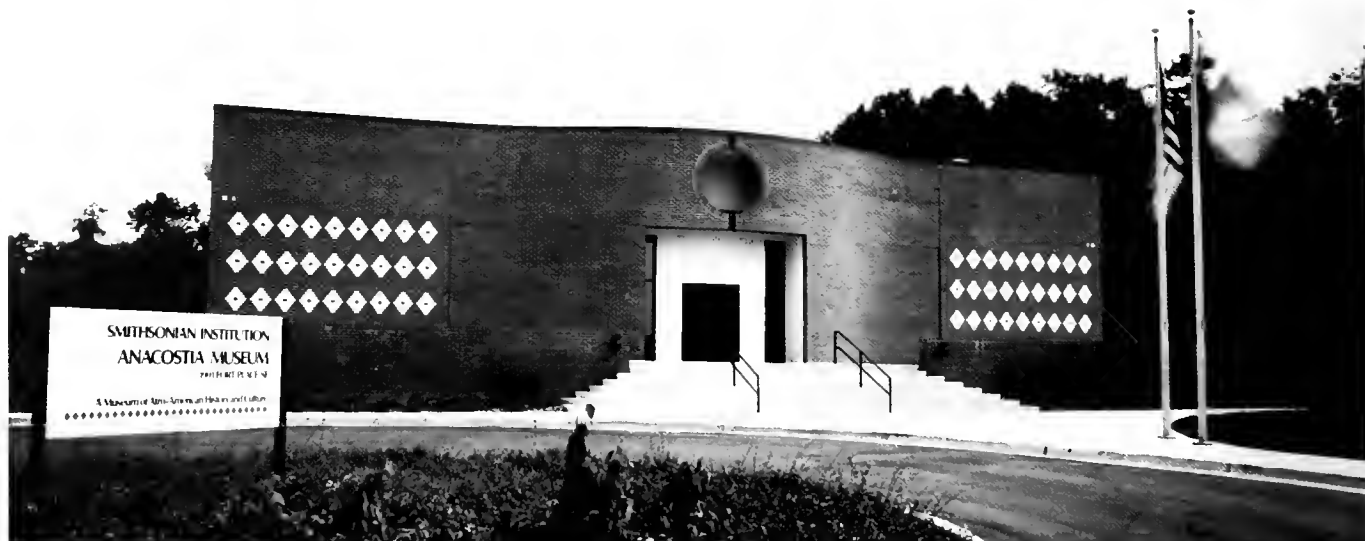
Staff Changes and Appointments

STRI Director Ira Rubinoff began a one-year sabbatical on July 1. James Karr is serving as acting director, and Alan Smith as acting deputy director.

MUSEUMS

Tom L. Freudenheim, Assistant Secretary for Museums

Anacostia Museum



The Anacostia Museum's new facility opened in May 1987. (Photograph by Harold Dorwin)

Two decades ago, in a converted movie theater, a novel museum was born. Originally intended to serve the residents of Southeast Washington, D.C., the Anacostia Neighborhood Museum evolved from a strictly local institution to a museum internationally recognized for its programs on Afro-American history, art, and culture. Along the way, it inspired the creation of more than one hundred Afro-American museums across the United States.

Fittingly, in the year of its twentieth anniversary, the museum underwent important changes. It shed the "neighborhood" designation in its name, a change that reflects the museum's national and international reputation, and in May, the Anacostia Museum unveiled its new, more spacious facility, atop Fort Place in Southeast Washington's historic Fort Stanton Park. For the first time in the museum's existence, all staff and activities are housed at one location. The consolidation will foster more creative and productive collaborations among staff members, and it will enhance the research, design, and production of exhibitions and educational programs.

The Anacostia Museum's new quarters feature an exhibition hall, a multipurpose room, and offices. Scattered about the wooded grounds are picnic tables and benches. To inform visitors of the historical significance of Fort Stanton Park, named for the fort built to protect the Navy Yard during the Civil War, the National Park Service will install a panel exhibit in the museum's lobby.

Exhibitions and Educational Programs

The museum's main thrusts continue to be enlightening visitors about Afro-American culture and explaining the social, political, and cultural contributions of black Americans. "Contemporary Visual Expressions," the inaugural exhibition at the new facility, demonstrated these

aims. The exhibition featured the works of four contemporary black American artists: Sam Gilliam, Martha Jackson-Jarvis, and Keith Morrison—all of Washington, D.C.—and William T. Williams of New York. "Contemporary Visual Expressions" was organized by visiting curator Dr. David Driskell, professor of art at the University of Maryland.

Also in 1987, staff members carried out research and planning for the exhibition "Climbing Jacob's Ladder: The Rise of Black Churches in Eastern American Cities, 1740–1877," which describes the vital role these churches played in emerging black communities. The exhibition opened in October 1987. Another exhibition in preparation, "Afro-American Inventors and the Quest for Recognition, 1619–1930," will trace the contributions black Americans have made to technological progress. A companion publication is being written for this exhibition.

At its old location, the museum featured the exhibition "The Renaissance: Black Arts of the Twenties." Many visitors to the exhibition participated in tours led by members of the museum's Department of Education. Other activities at the old facility included a vintage-film series, talks on Afro-American art, poetry readings, and a program on Kwanzaa—the Afro-American holiday based on the African harvest festival.

At its new quarters, the museum resumed its popular "Lunch Bag Forums," which featured talks by artists Sam Gilliam and Keith Morrison. In the series "Meet the Artists," five local artists and craftspeople demonstrated their skills and gave informal talks. In addition, the museum offered a for-credit seminar on black visual artists that attracted teachers from several local school systems. With the help of a grant from the Women's Committee of the Smithsonian Associates, the Education Department organized a "Family Day" at the museum. Nearly five hundred people attended the event.

Archives of American Art

The Archives of American Art is the Smithsonian's research bureau in the field of American art history. Its collections of correspondence, photographs, and other documents total more than eight million items, providing the historical evidence scholars need to further their research. Through the efforts of its six regional centers, the Archives continually adds to its collections. Besides making its holdings available to researchers, the Archives encourages scholarship by publishing a quarterly journal and by sponsoring seminars, symposia, and lectures.

In 1987, graduate students, museum curators, college and university faculty members, and free-lance art historians made thirty-three hundred visits to the six regional centers, each one containing copies of the Archives' collections on microfilm. In addition, the Archives lent nineteen hundred rolls of microfilm to libraries around the country. One gauge of the research conducted at the Archives is the number of research publications based on studies of the collections. More than two hundred articles, exhibition catalogues, and books published during

Bertha, Etta, Claribel, and Moses Cone in India, 1907. The Baltimore Museum of Art: Cone Archives



the past year cited Archives sources. These works included major studies of Alexander Archipenko, Gene Davis, John Graham, John La Farge, John Singer Sargent, Charles Sheeler, John Storrs, early modernism in American art, and New Deal photography projects.

Exhibitions and Programs

In addition to lending selected documents to other museums for their exhibitions, the Archives organized an exhibition of photographs, letters, and other items illustrating the Bauhaus school and its influence on American art, design, and architecture. The Archives' center in Southern California organized a symposium, attended by hundreds, that examined the complex history of that region's visual arts. The Washington, D.C., center continued to sponsor its series of informal seminars, in which art historians discuss the problems and results of their current research.

Acquisitions

The Archives made many important additions to its collections in 1987. It acquired a large group of papers of Holger Cahill, which detail Cahill's roles as head of the Works Progress Administration's Federal Art Project and as promoter of American folk art. Also acquired were a substantial collection of the papers of Dorothy Miller, dealing with her postretirement career as author and adviser to collectors of modern art; the voluminous records of the Milch Gallery, one of New York's most prominent art galleries during much of this century; and the records of the National Arts Club, a thriving artists' organization founded in 1897. Esther McCoy, a leading West Coast architectural historian, donated her papers; Ise Gropius, widow of Walter Gropius, a founder of the Bauhaus school, provided a copy of her diary and memoirs; and Mrs. Abraham Rattner turned over important additions to the Rattner papers. The Archives also received informative groups of letters written by Alexander Calder, Cecilia Beaux, and William Glackens, and it microfilmed the papers of Claribel and Etta Cone, Baltimore's best-known collectors of modern art.

Collections Management

The transfer of the Archives card catalogue to the Smithsonian's main-frame computer advanced substantially in

1987, as did the inventory of collections and work to preserve items of special value. The Archives continued to make progress in its ambitious program to prepare detailed descriptions of its holdings of photographs and works of art on paper. During the past year, it received generous grants from the Mellon Foundation and the Getty Memorial Trust to support a three-year project designed to enhance descriptive information on the collections and to facilitate retrieval of this information.

Arthur M. Sackler Gallery and Freer Gallery of Art

The Arthur M. Sackler Gallery, housing an unparalleled collection of the art of Asia, opened on September 28, joining the Freer Gallery of Art as a Smithsonian museum devoted to research and exhibition in the field of Asian art. With this combination of museums, the Institution clearly established itself as a world center for the study of Asian art and culture.

Inaugural celebrations were tinged with sadness over the death of Dr. Sackler on May 26. As the museum's primary benefactor, Dr. Sackler had shown an enthusiastic interest in its development and had eagerly awaited the installation of his inaugural gift of approximately one thousand masterworks of Asian art. Jill Sackler, who shares her late husband's interest in the art and culture of Asia, attended the opening events, which included a symposium, a program of lectures on Asian art, a concert at the John F. Kennedy Center for the Performing Arts, and a festschrift in honor of Dr. Sackler.

During the months preceding the opening, the Sackler and Freer staff, who serve both museums, clocked countless hours of work, attending to the final preparation of the seven inaugural exhibitions, as well as publications and programs. Behind-the-scenes work also included moving the entire Freer Library to larger quarters in the 115,000-square-foot Sackler Gallery. A haven for scholars of Asian and American art since the Freer Gallery of Art opened in 1923, the library contains forty-five thousand volumes, half of which are in Chinese or Japanese, and more than two hundred periodicals. The new facility also features a slide library and provides much-needed space for the library's archives. Holdings include the Herzfeld Archive of Persian and Near Eastern architecture and archaeological sites; the Myron Bement Smith Archive, which offers extensive visual documentation on a wide range of subjects relating to the Islamic world; the Carl Whiting Bishop Collection of early twentieth-century photographs of China; the correspondence of museum benefactor Charles Lang Freer; and a collection of photographs of the Dowager Empress Cixi (1835–1908).

Distinguished guests of the galleries included Bernadette Chirac, wife of the French premier. The first official visitor to the Sackler, Mrs. Chirac toured the nearly completed galleries with Assistant Director Milo Beach and Dr. and Mrs. Sackler. Other distinguished guests who came to view the collections and discuss future exhibitions and programs were His Excellency Jamsheed K. A. Marker, ambassador of Pakistan, and his wife; His Excellency Kyung-Won Kim, ambassador of Korea; His Excellency El-Sayed Abdel Raouf El-Reedy, ambassador of Egypt; His Excellency Soesilo Soedarman, Foreign Minis-

ter Kusumaatmadja Mochtar, and Director of Museums Bambang Soemadio, all of Indonesia; His Holiness Dri-kung Kyabgon Chetsang Lama of Ladakh, India; and a delegation from the People's Republic of China Ministry of Culture.

Arthur M. Sackler Gallery

Dr. Sackler's inaugural gift was organized into four major thematic exhibitions and three smaller displays. "In Praise of Ancestors: Ritual Objects from China," the largest of the exhibitions, featured about five hundred Chinese ritual bronzes and neolithic jades, some dating to as early as the fourth millennium B.C. "Monsters, Myths, and Minerals," displaying 123 jades, bronzes, and ceramics dating from the eleventh century B.C. to the eighteenth century, explored the use of animal imagery in Chinese art, legend, and literature. "Pavilions and Immortal Mountains: Chinese Decorative Art and Painting" included more than two hundred examples of Chinese furniture, paintings, and objects in jade, lacquer, and ceramics, spanning the third century B.C. into the present century. "Nomads and Nobility: Art from the Ancient Near East" featured Dr. Sackler's small but choice collection of gold, silver, bronze, ivory, and ceramics from the ancient Near East, including Iran, Anatolia, and the Caucasus, dating from the third millennium B.C. through the seventh century.

During their exploration of the gallery's 22,000 square feet of exhibition space, visitors could also view three small installations: "Temple Sculpture of South and Southeast Asia," "Chinese Buddhist and Daoist Imagery," and "Persian and Indian Paintings: Selections from a Recent Acquisition." The last of these was a preview of a major exhibition of the Henri Vever Collection, scheduled for late 1988.

To enhance the viewing of serious and casual visitors alike, a variety of publications and guides was prepared for the museum's opening. *Asian Art*, a new quarterly journal published by Oxford University Press in cooperation with the Sackler Gallery, is aimed at scholars and Asian art enthusiasts in the general public. The handbook *Asian Art in the Arthur M. Sackler Gallery: The Inaugural Gift* features catalogue entries on 211 objects, as well as five essays, three maps, a glossary, an annotated bibliography, and an index. Other publications include a generously illustrated book about the new museum, four gallery guides, a general information brochure, a bimonthly calendar of events, five exhibition



posters, and a floor plan. An expanded docent corps, now numbering forty, added the Sackler collections and opening exhibitions to their tour repertoire.

Freer Gallery of Art

In preparation for a three-year construction project that will connect the Freer and Sackler galleries and expand conservation and collection-storage facilities, nine of the ten exhibition areas on the east side of the Freer Gallery were closed to the public in 1987. A representative selection of works from the Freer's Chinese, Japanese, Indian, Near Eastern, and American collections remained on display.

The project will create convenient access between the two museums, and it will add greatly needed space and facilities for conservation work and for exhibition and storage of the Freer's collections, which have nearly doubled over the past fifty-four years. Literally "carved out" from beneath the Freer courtyard, the expanded facilities will increase the collection-storage area by 70 percent and will add more than 1,000 square feet of exhibition space. The area for conservation facilities, located on the ground floor of the Freer Gallery, will more than triple, from 1,750 to 5,765 square feet.

In addition, the north lobby's grand entrance, conceived by the Freer's architect, Charles A. Platt, will be returned to its intended use, as the gallery shop is to be moved to a larger, self-contained area on the ground floor. Construction plans also call for improved access for people with physical disabilities, renovation of the auditorium with staging area for public programs and an enlarged projection booth to accommodate simultaneous translation, and conference and teaching rooms. Expanded locker facilities for staff and additional restrooms, drinking fountains, and telephones are among additional improvements planned.

The Boston firm of Shepley Bulfinch Richardson and Abbott, architects of the Smithsonian's new museum complex, are the designers of the Freer construction project. Interior finishes and furnishings in the collection-storage areas are being designed by E. Verner Associates, Inc., also a Boston architectural firm.

"Nomads and Nobility: Art from the Ancient Near East," one of four major inaugural exhibitions at the Arthur M. Sackler Gallery, featured ceramics and metalwork from the Achaemenid, Parthian, and Sassanian empires. (Photograph by Kim Nielsen)



Conservator Jane Norman works on a thousand-year-old Chinese head of Buddha prior to its installation in the central staircase of the Arthur M. Sackler Gallery. (Photograph by John Tsantes)

Among the important additions to the Freer collections in 1987 was a jade bi (disk) made in China during the third millennium B.C. It was donated by the Charlottesville/Albemarle Foundation for the Encouragement of the Arts (CHALFA), a group that has made several generous contributions to the Freer Library. The ancient disk was presented to the Smithsonian in honor of Dr. Thomas Lawton, director of the Freer and Sackler galleries, who received the CHALFA Award for his "outstanding contributions to the arts."

The Visiting Committee of the Freer Gallery of Art added two members in 1987. Frederick Mote of Princeton University and Sherman Lee, director emeritus of the Cleveland Museum of Art, agreed to serve.

Research and Public Education

Programs of research and education at the Freer and Sackler galleries strive to make the brilliance and diver-

Conservation Analytical Laboratory

sity of Asian artistic traditions better known to the public—to people unfamiliar with Asia and to scholars and students for whom Asia is already the most exciting area on Earth. The museums' staff members contribute directly to this effort through their own studies. In 1987, the scholarly range of the museums was expanded with the addition of Dr. Ann Gunter, the curatorial staff's first specialist in the art of the ancient Near East.

The Freer and Sackler galleries continued the Freer's long-standing tradition of providing support for visiting scholars. In 1987, Dr. Wheeler Thackston, senior preceptor in Persian language at Harvard University, spent the summer in residence at the museums. As a Smithsonian-Rockefeller Foundation Resident in the Humanities, he studied Timurid inscriptions on paintings in the two collections in preparation for a major loan exhibition planned for 1989. Cao Yin and Song Xiangguang of the Department of Archaeology at Beijing University began a year of training in museum studies. Upon their return to the People's Republic of China, the pair will offer courses in museum operations at the university and at the new Arthur M. Sackler Museum of Art and Archaeology being built on the university's campus.

Also during the past year, the museums created a Department of Education and appointed Lucia Pierce, a specialist in Chinese studies, to direct the new unit. Working with other units of the two museums, the new department aims to engage young and old, scholar and non-scholar, with the rich and varied field of Asian art. A broad range of programs—from story-telling sessions that help children explore Asian traditions to lectures and live performances by international artists—has been developed in conjunction with the four major inaugural exhibitions of the Sackler Gallery.

The Conservation Analytical Laboratory (CAL) is the Smithsonian's specialized unit for research into the conservation, examination, and characterization of museum objects and related materials. Members of the laboratory's staff, a multidisciplinary group of forty conservators, scientists, and engineers, often assist specialists in other bureaus. CAL also features a growing training program for conservators and conservation students, and it provides an array of information services to professionals at other museums and to the general public. Last year, for example, a team of CAL staff members provided on-site technical assistance and training at an important archaeological excavation in Harappa, Pakistan.

A sampling of other activities and accomplishments during 1987 is presented below.

Archaeometric Research

The Conservation Analytical Laboratory is internationally recognized for its expertise in unlocking the secrets of past cultures from archaeological artifacts. Such archaeometric research uses a variety of analytical techniques to determine, for example, the basic chemical composition of ancient artifacts and to gather clues about how the objects were made. Pieced together with other archaeological and anthropological evidence, this information may reveal whether the artifacts were made in the area or brought by trading expeditions from another region.

To get this fundamental information, CAL staff members employ an array of sophisticated instruments—housed at the laboratory and at the National Bureau of Standards' research reactor in Gaithersburg, Maryland. Working at the reactor, a source of neutrons that is essential for several analytical methods, CAL researchers made excellent progress in characterizing Hopi ceramics. These efforts, now proceeding into the second phase of a wide-ranging multidisciplinary study involving Hopi representatives and several institutions, are helping to define the social dynamics of the Indian nation during and after the great migrations of the last quarter of the thirteenth century, a period of extreme drought in the Southwest. The resulting consolidation of once widely dispersed Hopi communities into seven major pueblos was accompanied by major changes in styles of pottery and in the way the ceramics were made.

In another project, laboratory researchers are using neutron activation analysis and other techniques to study the pottery of early Spanish settlements in Central America and Spanish La Florida. They are comparing these

analyses with those of similarly styled ceramics found in Spain.

Other archaeometric research focuses on the ceramics of the Middle and Far East. Laboratory researchers and collaborating French archaeologists completed their study of the ceramics of the Middle East's Helmand and Indus Valley civilizations, while analyses of the faience wares (fine, glazed pottery) from the Middle and Far East continued. Studies of Korean celadons (sea-green pottery and porcelain) and Chinese stonewares—an investigation involving scientists from the People's Republic of China—progressed in 1987. CAL researchers also are investigating Islamic frit-porcelain—similar in appearance to Chinese porcelain, but made from glass instead of clay—and the trade of ceramics in West Asia between A.D. 700 and A.D. 1000. In a collaborative effort, CAL organic chemists and the Yale University Ethnobotany Department are analyzing resins from trees in Malaysia for clues to the area's cultural heritage. The indigenous peoples of Malaysia and of other parts of Southeast Asia still use tree resins for a variety of purposes, including dyes, glue, and medicine. By characterizing these tree resins, the researchers hope to learn more about archaeological objects found in the region.

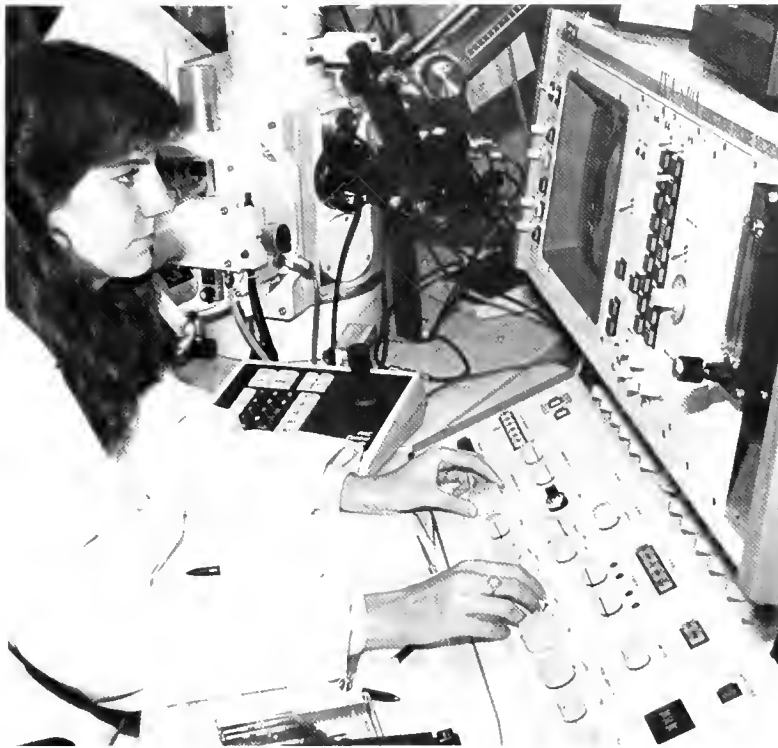
Among the new projects begun in 1987 was an investigation of potential sources of ore for early Middle Eastern silver and bronze manufacture. Another new project is focusing on the earliest known ceramics, which were unearthed in Czechoslovakia. Estimated to date back to 26,000 B.C., the artifacts include figurines of Venus and of mammoths, wolverines, deer, and other animals.

In its continuing collaboration with the National Museum of American Art, the laboratory used autoradiographic techniques and other methods in a study of the works of Albert P. Ryder, who is noted for his landscape and marine paintings. Lead isotope analyses of Chinese bronzes from the Sackler Gallery collection were completed in 1987.

Conservation Research

The objective of the laboratory's conservation research is to understand, at a fundamental level, the chemical and physical processes that can damage museum objects. This knowledge serves as the basis for devising preventative measures or new protective techniques.

In a project supported by the Getty Conservation Institute, CAL launched a major study of the effects of a widely used fumigant on proteinaceous materials, such as



Conservation Analytical Laboratory scientist Melanie Feather uses the newly installed scanning electron microscope/electron microprobe to study a sample of an archaeological plaster object. The resulting information helps to elucidate questions about condition and manufacturing technology.

leather, silk, and wool. In other projects, the conservation of books, documents, and other paper-based objects is being examined from several perspectives. One continuing study is assessing the validity of methods of accelerating the aging of paper as analytical tools for understanding natural aging behavior. Another study is comparing the effectiveness and safety of using different wavelengths of light for bleaching discolored paper. Researchers are also evaluating how treatments using water and other solvents affect the bonding within and between fibers in paper.

The laboratory's ongoing studies of climate in buildings include an investigation of the Renwick Gallery's reconstructed facade. Automated sensors were installed, allowing for continuous monitoring of humidity conditions and heat-transport phenomena.

To guide the laboratory's research on preserving photographs, an advisory committee of experts was formed. Meeting for the first time in 1987, the committee assisted

Cooper-Hewitt Museum

in setting short- and long-range objectives for the photograph-conservation project and helped select a scientist to start the recommended research.

A laboratory study of a large marble statuary yielded an improved cleaning technique, and a separate project evaluated the effects of boiling on archaeological iron artifacts, a treatment commonly used to remove chlorides. In preparation for the treatment of seven-thousand-year-old neolithic plaster figurines from Jordan, a series of consolidants were tested for their appropriateness and effectiveness.

To strengthen its conservation program, the laboratory recruited a materials research engineer in 1987. Anticipated activities for this new staff member include implementing a program to study the mechanical properties of the material components of museum objects. The effect of changes in chemical composition on complex mechanical strain patterns and the resultant deterioration of these objects would be part of the research program.

Training

The laboratory's conservation training program expanded significantly in 1987. A cooperative agreement with the Materials Science and Engineering Department at the Johns Hopkins University established a new university graduate program in conservation science, in which research will be conducted at CAL. Laboratory staff members will teach several of the courses offered in the program. In 1987, CAL awarded fellowships to two students. In addition, six new postgraduate conservation internships were added to the laboratory's training program for professional conservators and students. These interns were placed at various conservation laboratories in the Institution.

The first class in CAL's four-year training program in furniture conservation successfully completed its initial year of coursework. The laboratory also organized several in-depth courses for specialists, and it produced an instructional videotape on humidity control in museums.

In the information program, staff members continued to integrate the laboratory's bibliographic files into the new international Conservation Information Network, which became operational in September 1987. Staff members also consulted on conservation-related problems with their counterparts at other Smithsonian bureaus and at other museums in the United States and abroad. In addition, CAL responded to questions from the general public.

The Cooper-Hewitt Museum, the Smithsonian's National Museum of Design since 1967, was founded ninety years ago as a working resource, a visual index to the history of the design arts. Located in New York City, the museum occupies Andrew Carnegie's Georgian-style mansion and a neighboring townhouse—gifts of the Carnegie Corporation to house the museum and its vast collections. Wall coverings, decorative art objects, textiles, and prints and drawings constitute the nucleus of this world-famous center for the study of design. The museum's inventoried permanent collection numbers more than 167,000 items, representing the cultures of Europe, Asia, and other regions of the world over a span of three thousand years. The museum's library houses fifty thousand volumes, including five thousand rare books, that expand on the themes of the object collection and serve as a unique resource for scholars and designers alike.

Exhibitions

The Cooper-Hewitt's active and diverse program of changing exhibitions continued to attract both popular attention and critical acclaim. In 1987, the museum presented twelve exhibitions. "Milestones: Fifty Years of Goods and Services" marked the golden anniversary of the Consumers Union and presented fifty innovations that, in the view of *Consumer Reports* magazine, "revolutionized our lives."

Two major surveys of the museum's permanent collections celebrated the Cooper-Hewitt's tenth season in its present facilities. "Perspective: The Illusion of Space" considered the ways artists, designers, and architects have used the rules of perspective to create an illusion of space in two-dimensional drawings. "Recollections: A Decade of Collecting" represented traditional and innovative collecting patterns in each of the museum's departments: textiles, decorative arts, prints and drawings, and wallpaper. Smaller exhibitions devoted to other aspects of the permanent collections included "Folding Fans," a fascinating look at beautifully designed and crafted objects from Europe and the Orient; "Safe and Secure: Keys and Locks," with examples from ancient to high-tech times; and "Crystal Palaces," a survey based on a volume of extremely fine and rare nineteenth-century photographs of London's original "Crystal Palace."

Two important international exhibitions highlighted modern architecture and design. Both exhibitions—"Berlin 1900-1933: Architecture and Design" and "The Catalan Spirit: Gaudí and His Contemporaries," which



Made of iron, this Spanish lock and key probably came from a chest dating from the late sixteenth or early seventeenth century and were featured in the Cooper-Hewitt Museum's exhibition "Safe and Secure: Keys and Locks."

focused on Barcelona—were well received by critics and the general public. Additional architectural exhibitions, organized by outside groups and modified by the Cooper-Hewitt staff for presentation in New York, explored selected works of Louis Sullivan and Frank Lloyd Wright, two of America's most original architects.

The museum staff also coordinated and produced companion publications for several of the exhibitions in 1987.

The German-English volume accompanying the exhibition on design and architecture in Berlin featured essays by four German scholars. A similar volume on Gaudí and his contemporaries will consist of essays by three American scholars and a Spanish colleague. A grant from the J. M. Kaplan Fund, Inc., helped support publication of both volumes. Collections handbooks for the "Folding Fans" and "Locks and Keys" exhibitions were published with the aid of the New York State Council on the Arts and the Andrew W. Mellon Foundation.

Collections Management

Management of the Cooper-Hewitt's extensive holdings is a continuous activity, involving careful inventorying and recordkeeping of new and existing items, monitoring and processing of loans to other museums, and storage and conservation of objects not on exhibition. More than six hundred acquisitions and thirteen hundred loan transactions were handled by the registrar during the first three quarters of 1987. Over the same period, the museum's Textile and Paper Conservation Laboratories treated nearly six hundred items that will be included in a future exhibition. Computer workstations were installed in the Registrar's Office and the Department of Decorative Arts, to be followed in the future by workstations in the remaining three curatorial departments.

The museum's most important purchase was a thirteenth-century needlework rendering of a bodhisattva, which is believed to have originated in China. Presumably in the seventeenth or eighteenth century, the figure was incorporated into a Buddhist temple banner. This remarkable object, purchased with the aid of the Smithsonian Institution Regents Special Acquisition Fund, was added to the other extremely rare Oriental textile specimens in the permanent collection. In addition, forty-six items donated by Barry Friedman and Patricia Pastor will form the nucleus of an industrial design collection planned by the museum. Particularly interesting items in this gift include the German "people's radio," which was the ubiquitous household receiver for the propaganda broadcasts of the Third Reich, and Ettore Sottsass's "Valentine" typewriter (c. 1969), which he designed for the Olivetti Company.

Education

The Cooper-Hewitt/Parsons–New School Graduate Study Program in the History of the Decorative Arts is

Hirshhorn Museum and Sculpture Garden

the Smithsonian's only formal academic degree-granting program. Accredited by the New York State Board of Regents, the program awards a Master of Arts degree upon acceptance of a satisfactory thesis and is a unique training center for museum curation and related fields. Ten students received degrees in 1987, and fifteen were accepted for enrollment during the upcoming academic year.

Other Cooper-Hewitt educational programs include classes, workshops, symposia, tours, and a variety of special events. In 1987, more than fifty-eight hundred students participated in these programs. The diverse study offerings during the past year included the architecture of ancient Greece and of great American cities, seventeenth- and eighteenth-century French decorative arts, the work of pioneering industrial designers of the twentieth century, the architecture and design traditions of modern Berlin and Barcelona, a thousand years of Chinese art, the history of the garden, the marine architecture of the 12-meter yacht, and the graphic design of contemporary comic books.

Staff Changes

After serving as director of the museum for nearly eighteen years, a span that featured more than 150 provocative exhibitions, Lisa Taylor retired in June 1987 and was subsequently appointed director emeritus. Assistant Director Harold Francis Pfister was named acting director.

Planning for the Cooper-Hewitt's fund-raising campaign, which is essential to the museum's intended expansion, has been delayed until a new director is appointed. In 1987, however, Representative Mary Rose Oakar of Ohio introduced a bill (H.R. 2815) to authorize a future appropriation of up to \$15 million for capital improvements. The bill, which calls for matching funds from private sources, is cosponsored by Representatives Edward Boland, Silvio Conte, Bill Frenzel, and Norman Mineta, and it was referred to the Committee on House Administration.

The Hirshhorn Museum and Sculpture Garden, the Smithsonian's museum of modern and contemporary art, maintained an active exhibition schedule and acquisition program in 1987. Complementary films, concerts, symposia, tours, and other educational activities supported these programs. The museum's reference library and its departments of conservation, registration, and photography continued to offer technical support to staff and scholars.

Exhibitions

The first major exhibition of the year, "Recent Acquisitions: 1983-1986," presented a selection of mostly contemporary works acquired by the museum since its last acquisitions show in 1983. Organized by Director James T. Demettrion, the exhibition included works by Siah Armajani, William Beckman, Richard Diebenkorn, Leon Golub, Robert Irwin, Jess, Anselm Kiefer, Edward and Nancy Reddin Kienholz, Sol LeWitt, Isamu Noguchi, Claes Oldenburg, Frank Stella, Donald Sultan, William T. Wiley, and others. "Nancy Graves: A Sculpture Retrospective," an exhibition organized by the Fort Worth Art Museum, began its four-city tour at the Hirshhorn Museum. Graves, who first received critical attention in the 1960s, creates open-form, multicolored sculptures whose imagery derives from natural history, the sciences, and objects of everyday life.

"Morris Louis," organized by the Museum of Modern Art in New York City, constituted the largest group of works by the Washington Color School painter ever to be assembled. Louis's major series of paintings—Veils, Unfurleds, and Stripes—were the focus of the exhibition. "Roger Brown," organized by Hirshhorn staff member Sidney Lawrence, was the first retrospective in an East Coast museum for the Chicago Imagist painter. The exhibition's national tour included stops at the La Jolla Museum of Contemporary Art, California; Lowe Art Museum, University of Miami, Coral Gables, Florida; and Des Moines Art Center, Iowa. The catalogue for the retrospective was published for the museum by George Braziller, Inc.

The Hirshhorn was the only American venue for "Lucian Freud Paintings," an exhibition of more than eighty works by the British realist. After opening its tour in Washington, the show, which was organized by the British Council, was seen in London, Paris, and Berlin.

Smaller exhibitions featuring works from the permanent collection included "Bridging the Century: Images of



Cubist Bust, 1912–13, a bronze cast by Oto Gutfreund, is a prime example of the transformation of sculpture during the early stages of Modernism. The work is a partial gift to the Hirshhorn Museum and Sculpture Garden from Mr. and Mrs. Jan V. Mladek and partial purchase through the Joseph H. Hirshhorn Purchase Fund.

Bridges from the Museum’s Collection,” organized by museum historian Judith Zilczer. Frank Gettings, curator of prints and drawings, organized two shows: “Patterned Images: Works on Paper from the Museum’s Collection” and “Arnold Newman Photographs Artists,” a selection of photographs of artists whose work is in the permanent collection. Moreover, a complete reinstallation of the museum’s second floor incorporated recent acquisitions and a number of works from the permanent collection that had not been on view previously.

In addition to creating its own exhibitions, the museum lent ninety objects to forty institutions in 1987. Among the many sculptures borrowed were four works by Alexander Archipenko for the National Gallery of Art’s centennial tribute to the sculptor and two pieces by John Storrs for an exhibition at the Whitney Museum of American Art in New York City. The Hirshhorn lent nine paintings to Chicago’s Terra Museum of American Art for “A Proud Heritage: Two Centuries of American Art, with Selections from the Hirshhorn Museum and

Sculpture Garden.” A four-panel work by Donald Sultan was lent to Chicago’s Museum of Contemporary Art for its show of the artist’s work and for the exhibition’s subsequent tour. The museum also lent a painting by Leland Bell to the Phillips Collection in Washington, D.C., and three works by Gene Davis for a memorial exhibition at the National Museum of American Art. The Hirshhorn also made significant loans to foreign institutions for their exhibitions, including “Giacometti Dynasty” at the Museo Rufino Tamayo in Mexico City and “Cy Twombly,” whose itinerary included stops in Switzerland, Spain, England, and France. In addition, a small group of paintings was included in “New Horizons: American Painting 1840–1910,” an exhibition organized by the Smithsonian Institution Traveling Exhibition Service for a tour to the Soviet cities of Moscow, Leningrad, and Minsk.

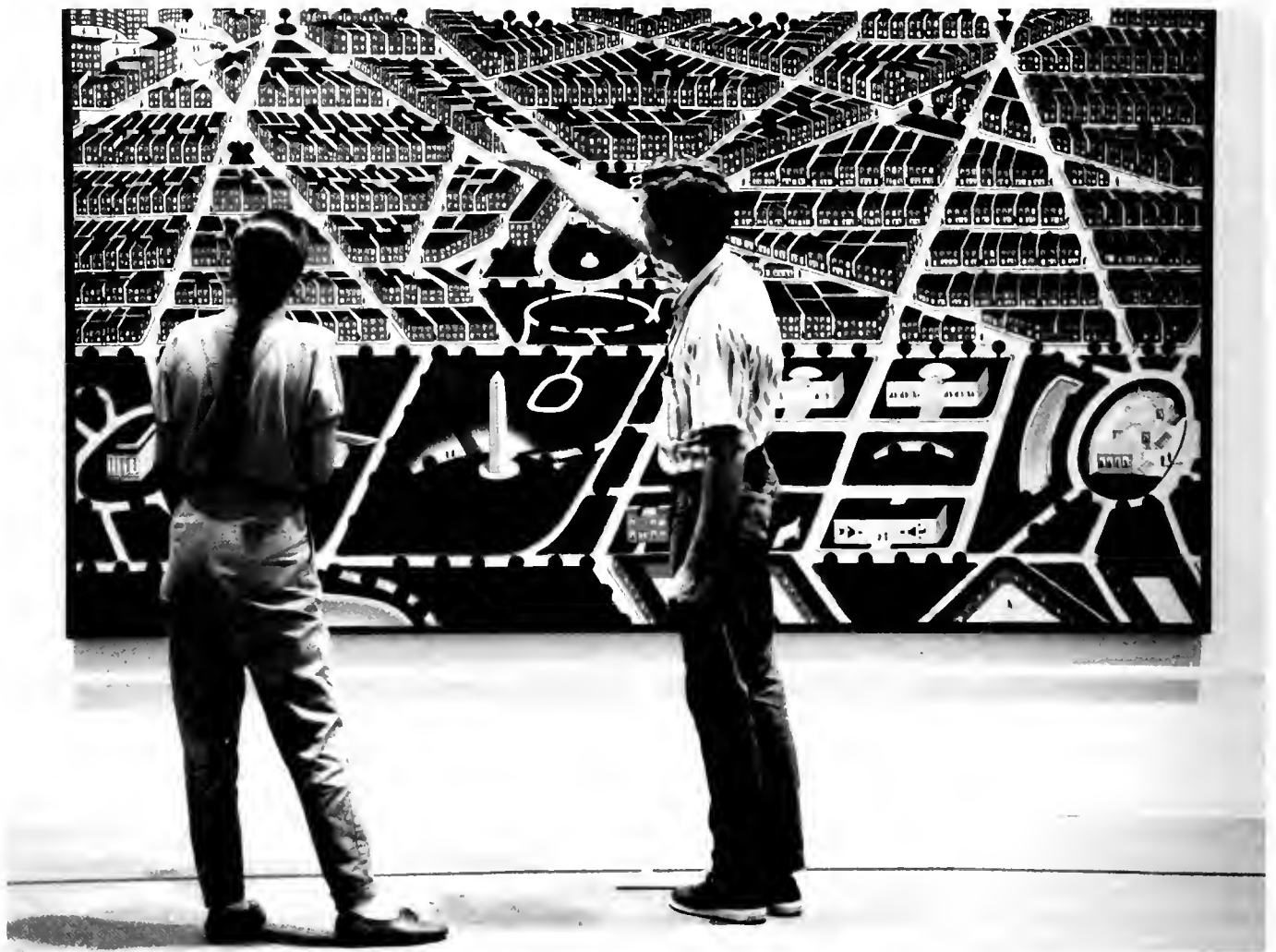
Education

The Hirshhorn Museum has broadened its efforts to enhance the experience of visitors who come to view its special exhibitions and permanent collection. Besides adding about 900 square feet of exhibition space in lower-level galleries and relocating the gift shop to the first-floor lobby, remodeling work created a small audiovisual theater that is used to acquaint visitors with the museum. The orientation room features, on an alternating basis, a program about the current special exhibition and an introduction to the Hirshhorn Museum and Sculpture Garden. Production of the ten-minute introductory presentation was funded by a grant from the J. Paul Getty Trust.

Designed to help viewers understand specific aspects of the collection, a series of small brochures was launched. The printing of the first guide, *Cubist Sculpture*, was underwritten by the Women’s Committee of the Smithsonian Associates.

The orientation program and new guides will bolster the museum’s already strong outreach programs. The Department of Education initiated a special effort to recruit members of minority groups for its docent program; four were among the twenty new docents trained in 1987. The museum’s one hundred docents conducted tours for more than seventeen thousand visitors during the year. In addition, four undergraduate students participated in the Hirshhorn’s summer internship program.

The “Currents” seminars for high school students continued, and new programs attracted students from the



Visitors to the Hirshhorn Museum and Sculpture Garden's retrospective *Roger Brown* enjoy the artist's depiction of Washington, D.C.

area's elementary and secondary schools. Regularly scheduled films about and by artists continued to be popular, as did the museum's special program of films for young people.

Acquisitions

The museum's permanent collection was enriched by twenty-four gifts and ten purchases. Among the recent acquisitions were three important examples of early Modernism: *Seguidilla* (1919), a painting by Man Ray that evokes the rhythms and music of the Spanish dance,

and two bronze casts, *Angst* (1911) and *Cubist Bust* (1912–1913), by the Czech sculptor Oto Gutfreund, whose fusion of elements of Cubism and Expressionism marked the transformation of sculpture into a new idiom. Other newly acquired paintings included *Coral Tree* (1983) by Robert Helm; *My Barn on a Summer Night* (1982) by Wolf Kahn; and *Night Portrait* (1985–1986), by Lucian Freud. Among the notable sculpture acquisitions were *Untitled* (1986), a large-scale work in stainless steel by Ellsworth Kelly, which was installed on the plaza; *2-2-1: To Dickie and Tina* (1969, fabricated in 1986), a delicately balanced work in steel by Richard Serra; and *Untitled* (1986), a construction of lead, steel, and wool by Jannis Kounellis.

National Air and Space Museum

The National Air and Space Museum (NASM) is now under the leadership of Dr. Martin Harwit, formerly a professor of astronomy at Cornell University and codirector of the university's program in the history and philosophy of science and technology. Dr. Harwit, who succeeded Acting Director James C. Tyler, has a long-standing interest in linking research and education and in communicating the major issues in aeronautical and space research.

The new director assumed his duties in August, near the end of another successful year of exhibition, research, and education at one of the world's most popular museums. These activities are described below.

Research

International in scope, the programs of the museum's three research and curatorial units—the Department of Aeronautics, Department of Space Science and Exploration, and the Center for Earth and Planetary Studies—span the past and future of flight and broaden public understanding of the heavens and Earth. The activities of resident staff members are augmented by visiting scholars, who use the museum's singular collections of resources to pursue their research interests.

In 1987, the Department of Aeronautics hosted three visiting scholars, enhancing the museum's role as an international center for the study of the history of flight. Appointed to the Charles A. Lindbergh Chair of Aerospace History, Dr. John D. Anderson, University of Maryland professor of aerospace engineering, conducted research toward a definitive history on aerodynamics and furthered his work on hypersonic flight. As International Fellow, Ing. Jose Vilella Gomez, Mexico's leading aviation historian, studied the growth and development of the Mexican Air Force and the early Mexican airlines. Professor Louis R. Eltscher of the Rochester Institute of Technology completed his term as Verville Fellow, during which he studied the Curtiss-Wright Aeronautical Corporation and C-46 transport plane.

Members of the Aeronautics Department continued to write articles and books for scholarly and popular audiences. *Rebels and Reformers of the Airways*, by R. E. G. Davies, curator of air transport, reveals the pioneering contributions that a select group of individuals and companies made to the now booming business of air delivery. Department Chairman Von Hardesty, was coeditor and translator for the English language version of *Igor Sikorsky, The Russian Years*, a Russian classic written by K.

N. Finne in 1930. Howard Wolko, special adviser for technology, edited *The Wright Flyer: An Engineering Perspective*, a technical examination of the world's first aircraft. *Focke-Wulf Fw 190: Workhorse of the Luftwaffe*, the ninth volume in the Famous Aircraft of NASM series, was completed by assistant curator Jay Spenser, who gives a detailed account of the remarkable German fighter plane. In a joint project, the Aeronautics and Space Science and Exploration departments completed the final manuscript for *Air and Space History*, an annotated bibliography of the history of aviation and spaceflight. The bibliography, which will be published in spring 1988, will fill a gap in the reference literature of aviation and space history.

With the support of the Sloan Foundation and the museum's Office of University Programs, the Aeronautics Department conducted an intensive two-week seminar in the history of aviation for students of Wellesley College's Technology Studies Program. The course, which demonstrated how museum collections and exhibits can be used as effective teaching tools, is the prelude to an even more ambitious instructional program, now in the planning stages. In 1987, the Sloan Foundation awarded a grant to the Institution for creating a college-level curriculum in the history of aeronautics, also based on museum resources. At a June meeting, representatives of NASM and the foundation's New Liberal Arts Program began preparing for a workshop on the "History of Aviation, Spaceflight, and Related Technology." Products of the January 1988 workshop will be a videodisc demonstrating key themes in the history of aeronautics and spaceflight, as well as written course materials. Together, these instructional tools will constitute an aviation module in the New Liberal Arts Program's courses in the history of technology.

In the Department of Space Science and Exploration, a novel program, supported by the Glennan-Webb-Seamans Fund for Research in Space History, completed its second year. Using oral history interviews and traditional historical research techniques, department members and visiting scholars are examining the impact of large, publicly funded air and space programs in a societal context. The evolution of national policies, techniques and systems of management, and the nature of the interactions between the public and private sectors are among the subjects under study in this multifaceted research program.

The department also made progress in its efforts to establish a corporate history program, which would trace the contributions of U.S. firms to space science and ex-



ploration. The starting point is the Rand Corporation, a significant, if not well-known, force in the development of space travel. The cooperative project is documenting the founding and early history of the company. With support from the Rand Corporation, the Glennan-Webb-Seamans Fund, and the Smithsonian-Sloan Videohistory Project, the department aims to broaden its research focus to other space-oriented firms.

The past year was an especially productive one for the Program in the History of Space Science, a cooperative undertaking involving NASM and the Johns Hopkins University. Initially, participants in the two-year-old program are concentrating on the history of the Hubble Space Telescope—the yet-to-be-launched instrument that will peer many times further into the universe than the most powerful ground-based telescopes. During 1987, members of the program completed a series of valuable resource publications: *Guide to Space Telescope Archives*, *Catalog of Space Telescope Oral History Interviews* (which lists some 120 interviews), *Space Telescope Bibliography*, and *Selected Items in the History of the Space Telescope*. Another publication, *Shaping the Space Telescope: The Interpenetration of Science, Technology, and Politics*, is in preparation and scheduled for publication by Cambridge University Press in 1988. A newly established resource unit at the museum serves as the repository for documents and pictorial materials related to the Space Telescope.

During 1987, Dr. Herbert Friedman, U.S. Naval Research Laboratory (NRL), occupied the Martin-Marietta Chair in Space History, spending the majority of his tenure researching and writing a memoir on the origins of X-ray astronomy. While Dr. Friedman was a resident scholar, he and members of his original X-ray astronomy group at NRL participated in videotaped interviews, which were conducted as part of the Smithsonian-Sloan Videohistory Project. Also during his tenure at NASM, Dr. Friedman was awarded the Wolf Prize for his contributions to high-energy physics.

In other scholarly endeavors, curator David DeVorkin of the Space Science and Exploration Department completed a major manuscript titled *The Origins of Strato-*

spheric Science in the United States. The manuscript was submitted to a publisher for examination.

At NASM's Center for Earth and Planetary Studies, basic research on remote sensing of terrestrial and planetary surface features continued, with emphasis on the Earth's desert regions and the Martian landscape. Analyses of satellite images of Egypt, Mali, and Botswana traced changes in the landscape of these African countries over a nine-year period. Studies of *Landsat* data indicated significant movement by active dunes. In contrast, images of dunes stabilized by vegetation revealed no migration, although lack of rainfall has increased local erosion. These findings have been corroborated and extended by fieldwork carried out in 1986.

Mapping of sand sheet deposits continued in the hyper-arid desert core in western Egypt and northern Sudan. Ancient drainage patterns now buried by the sand were revealed by the Space Shuttle Radar Experiment. Current mapping efforts concentrated on adjoining areas that were outside the experiment's radar surveillance. In addition to providing a more complete picture of the ancient drainage network, the center's studies in 1987 identified where significant movement of the sand cover has occurred. Estimates of total sand transport in these areas are being prepared for comparison with the amount of sand transported by dunes.

Data from *SPOT*, the French remote sensing satellite, furthered center studies of deserts in Egypt and Saudi Arabia. Satellite images are being used to map changes in sand-dune patterns and variations in reflectivity in the Bahariya Oasis region of western Egypt. The high-resolution data allow more precise estimates of the extent of sand cover and even permit determination of whether individual fields are under active cultivation.

The center's planetary research capitalized on several new methods for analyzing data from the *Viking* probe of Mars. With individual images gathered by the satellite, investigators are using crater statistics to interpret the relative ages of tectonic events on the planet. This approach may help explain the unusual topography in the eastern equatorial region of Mars, where ancient, highly cratered terrain abuts the smooth plains of the Northern Hemisphere. The origin of this planetary dichotomy is under debate, with competing theories suggesting a giant collision, crustal overturning, and other factors as potential causes. Studies by Dr. George McGill, a visiting scientist from the University of Massachusetts, indicated that faulting along the boundary occurred over a short period and that different areas within the region were active at different times in Martian history.

An exhibition of aviation art by contemporary artist William S. Phillips went on display at the National Air and Space Museum on June 19. This 46-by-36-inch oil painting, *Into the Sunlit Splendor*, was the signature piece of the show, which bore the same title.

In other activities, Ted Maxwell, chairman of the Center for Earth and Planetary Studies, continued to serve as editor for the Smithsonian Library of the Solar System series. The series' second volume, *Mercury: The Elusive Planet*, by Robert Strom, was published during the past year.

Collections

The museum acquired several historically significant aircraft in 1987. These include: *Voyager*, the first aircraft—flown by Dick Rutan and Jeana Yeager—to make a non-stop, unrefueled trip around the world; a rare 1930s vintage Junkers Ju-52 transport, donated by Lufthansa; and famous acrobatic pilot Art Scholl's modified de Havilland DHC-1 *Special Chipmunk*.

NASM received the full-scale Hubble Space Telescope Structural-Dynamic Test Vehicle. Studied in great detail by members of the museum's Space Telescope History Project, the test vehicle, measuring 43 feet long and 15 feet in diameter, is the only full-scale counterpart to the spacecraft that is awaiting launch from the Space Shuttle. Restoration will begin in 1988.

The National Air and Space Archives accessioned 122 document collections in 1987. The more notable acquisitions included personal papers and photographs of James E. Webb, the boomerang documentation of Benjamin Ruhe, six hundred patents from the Curtiss-Wright Corporation, drawing collections of Peter W. Westburg and Nicholas Van de Grift Karstens, and the records of the Women Flyers of America. The Film Archive collected more than 1,300 additional films, including 250 reels from the Bell Aerospace Corporation and more than twenty-five hours of documentation of the first 150 Delta missile launches.

The newly organized Collections Management Department includes the Office of the Registrar, the Information Management Division, and the Collections Maintenance and Preservation/Restoration divisions at the Paul E. Garber Preservation, Restoration and Storage Facility in Suitland, Maryland.

At Washington Dulles International Airport, the Garber staff is overseeing completion of a pre-engineered storage facility that will house the *Enterprise*, the prototype Space Shuttle, as well as several other large aircraft currently in outdoor storage at the airport. (During the past year, several NASA and contractor teams used the orbiter for testing and other work related to the overhaul of the nation's Space Shuttle fleet.) A second concrete pad



In an effort to make the space shuttle program safer, tests were conducted during June 1987 by the National Aeronautics and Space Administration on the Space Shuttle *Enterprise*, now in the collection of the National Air and Space Museum. A runway arresting system was tested and an astronaut film on emergency escape procedures was taped.

was added for storage of a Lockheed Super Constellation, which will soon be added to the aircraft collection. At the Garber Facility, several major restoration projects are nearing completion: a Fowler-Gage wooden biplane, an OS2U Kingfisher seaplane, an Arado 234 German bomber, the *ATS-6* satellite test model, and the forward fuselage of the Boeing B-29 *Enola Gay*.

The Office of the Registrar is participating in the development of the Smithsonian-wide Collections Information System. As part of this effort, the office, working with the curatorial departments and the Collections Maintenance Division, will extend the utility of the museum's automated inventory system, developed during the past year by Howard Wolko. The end product will be an in house collections information system tailored to NASM's research and collections-management requirements.

Two analog archival videodiscs were completed in 1987 by the museum's Information Management Division. NASM Videodisc 4 contains the remaining fifty thousand

images of the U.S. Air Force's pre-1954 still-photo collection; Videodisc 3 contains the first one hundred thousand images. Videodisc 5, also issued in 1987 and produced in collaboration with NASA and the Center for Earth and Planetary Studies, holds images from the space agency's public affairs collections and 70-millimeter photos shot during Space Shuttle missions. Also in cooperation with NASA, work was begun on Videodisc 6, which will feature lunar images taken during Ranger, Surveyor, and Apollo missions.

Exhibitions

Emphasis in 1987 was on updating major galleries. The World War I Gallery, one of the first exhibitions to open in 1976, was dismantled and is being redesigned. The new exhibition, "World War I Aviation: The Emergence of Air Power," will focus more on the harsh realities of conflict in the skies, and it will explore more fully the development of aviation as an integral element in warfare. The Stars Gallery was greatly expanded with the addition of a section on the Hubble Space Telescope, which draws heavily on the museum's history project, and a section on infrared astronomy, which includes a full-scale replica of the *Infrared Astronomical Satellite* and an array of other telescopes and detectors.

A special exhibition devoted to the realist aviation art of contemporary American artist William S. Phillips opened in the Flight and the Arts Gallery. "Into the Sunlit Splendor" featured forty-five works based on the artist's own experiences and his interpretation of historical events. The exhibition catalogue was written by Mary Henderson, curator of art.

In the Space Hall, the new exhibition "America's Space Truck" tells the story of the Space Shuttle Program, from the first launch of the *Columbia* in 1981, through the disaster of the *Challenger* in 1986, to NASA's plans for the future. For two months, a children's art unit, provided by McDonnell Douglas, was added to the exhibition. The forty-five pictures drawn by the five- and six-year-olds who participated in "Lollypops & Launchpads II" clearly demonstrated that children can grasp sophisticated concepts of space exploration and express them in creative ways.

To commemorate the hundredth anniversary of the birth of Italian aviation pioneer Gianni Caproni, an exhibit featuring Italy's first military aircraft, the 1912 Caproni CA.9 monoplane, was opened in the Early Flight Gallery.



On August 31, the National Air and Space Museum was the site of a tour by Soviet cosmonaut Valentina Tereshkova (left), the first woman to travel in space; U.S. astronaut Mary Cleave (center); and an unidentified interpreter. Among the sights the women viewed was the Apollo-Soyuz Test Project, a cooperative mission carried out in 1975 by the space agencies of the Soviet Union and the United States.

The museum produced six films or videotapes to highlight new exhibitions. *Portrait of a Fighter*, which featured the F6F Hellcat, won a bronze Cindy Award for excellence in film production. Two additional presentations were produced in 1987—one for a public service announcement and the other for fund-raising purposes.

Frank Florentine, NASM's lighting designer, was recognized for his work in the Looking at Earth Gallery, where he achieved a dynamic lighted display of full-size satellite models, high-altitude aircraft, and other items. Florentine received the 1987 Edwin F. Guth Memorial Award from the International Illumination Engineering Society and the 1986 Edison Award for lighting design excellence from the General Electric Company.

In an effort to expedite the process of producing exhibitry at the museum, the Advanced Projects Department has been experimenting with "Autocad," a computer-aided design program. The computer-aided approach is being used during design drafting, the most time-consuming stage of the process. Results thus far have been encouraging.

Public Events and Educational Programs

The museum offers a wide range of programs for the education and entertainment of the public and for the advancement of research and scholarship in the fields of aviation and space science. For example, the monthly Contemporary History Seminar, a regular NASM program, fostered discussion among scholars studying museum-related subjects. A two-day conference sponsored by the museum and NASA's History Office featured formal lectures and structured discussions on air and space history, which will be published as a conference volume.

Events for the public included already well-established programs and some novel additions. NASM's Office of Public Affairs and Museum Services, in cooperation with the museum's Office of Education, designed and promoted a ten-week series of family nights. Held on Fridays, the "Fly-by-Night" program included lectures, films, and a variety of other free activities. The public affairs office also handled promotion of the new planetarium show, "State of the Universe." To nurture interest in the show's debut, the office sponsored a "Cosmic Costume Contest," which attracted a large number of visitors, many of them disguised as aliens, heavenly bodies, and sky watchers.

"State of the Universe," a fascinating dramatization of how perceptions of the cosmos have changed with ever more sophisticated observing techniques, added to the Albert Einstein Planetarium's string of successful shows. The 1987 version of the annual lecture series Exploring Space, cosponsored by The Perkin-Elmer Corporation, complemented the new show. Five distinguished guest lecturers discussed "New Perspectives on the Universe." Other programs held in the planetarium during the past year included "Messages from the Universe," a broad-reaching symposium that commemorated the three-hundredth anniversary of Isaac Newton's *Principia*. In February, the facility's staff, actor Arthur Peterson, and the Federal Theater Project of George Mason University co-produced "Abraham Lincoln: A Celebration of Freedom." More than 330,000 visitors attended planetarium shows in 1987, a 10 percent increase over the previous year.

The five IMAX® films previously commissioned by the museum—*On the Wing*, *The Dream Is Alive*, *To Fly!*, *Living Planet*, and *Flyers*—again played to full houses in the Samuel P. Langley Theater. In its first eleven years, the theater counted more than eighteen million paying customers and boasted an enviable occupancy rate of 73 percent.

Other offerings for the public included nine General Electric Aviation Lectures; twelve Monthly Sky Lectures; the annual Wernher von Braun Lecture, given by former NASA administrator Thomas Paine; the annual Lindbergh Lecture, given by Lt. Gen. Benjamin O. Davis, the U.S. Air Force's first black general; nine aviation films; and eight space fiction films. The museum staff also organized special programs for the Smithsonian National Associates, including a four-day seminar on space history held in Madison, Wisconsin.

"Wings and Things," the annual open house at the museum's Paul E. Garber Preservation, Restoration and Storage Facility, attracted more than fifteen thousand visitors who saw the more than one hundred air and space vehicles housed in the facility's five hangarlike buildings. Also well attended were the forty-five holiday and summer concerts organized and promoted by the Office of Public Affairs and Museum Services. To commemorate the sixtieth anniversary of Charles Lindbergh's transatlantic flight, the office organized "A Festival of American Music," which, appropriately, was held in the Milestones of Flight Gallery, beneath the *Spirit of St. Louis*.

Several museum publications were cited for excellence during the past year. "Exploring Space" won first place in a competition sponsored by the National Association of Government Communicators. The Society for Technical Communication also recognized the "Exploring Space" brochure, as well as the publication "Our Next 50 Years: A Look at the U.S. Space Program" and the brochure for the museum's 1986 symposium "Viking on Mars."

Publications and other services help ensure that visitors get the most informational value out of their stops at the museum. To aid international visitors, the museum offers recorded tours in English, French, German, Japanese, Spanish, and, as of 1987, Italian and Portuguese.

The NASM Office of Education was increased to four full-time staff members; their efforts are aided by interns from the George Washington University Museum Education Program and the Smithsonian's Stay in School Program and by Behind-the-Scenes volunteers. The result has been the initiation of several new projects and expansion of the museum's specialized programs for teachers.

The Office of Education organized eight workshops for teachers, from kindergarten through senior high school. In addition to discussing such topics as manned space-flight and the planets, the workshops featured tours of the museum's collections and a variety of hands-on activities for use in the classroom.

These and other activities should benefit greatly from the NASM Education Resource Center that is now in the

planning stages. The center will provide teachers with access to instructional materials in science, space, and aviation. NASA is participating in development of the center.

Another means of extending the museum's reach is an informal network of regional contacts. With a grant from the Institution's Educational Outreach Fund, NASM hosted twenty-nine participants in its Regional Resource Program. Staff members acquainted the visitors, who came from all sections of the United States, with the museum's collections, exhibitions, and research. Participants in the orientation program were given informational materials that they will use in presentations to groups in their communities.

Air & Space/Smithsonian

Only in its second year, *Air & Space/Smithsonian*, the bimonthly magazine for NASM Associates, has a circulation of three hundred thousand, tops among periodicals of its kind. High editorial quality and thorough surveillance of international developments have established *Air & Space* as the authoritative source for interpretive aerospace information.

The magazine's first anniversary issue (April/May 1987) included the special insert "The Satellite Sky," a graphic compendium of all active artificial satellites for which a function is known or surmised. Owing to demand, the chart was reprinted on sturdy paper for use in classrooms and professional settings. To keep the chart current, the magazine regularly publishes satellite updates, listing recent launches or spacecraft no longer in active service. Insofar as is known, the service is the only one of its kind in the world, and many accounts suggest that it is the definitive authority in the field.

Air & Space/Smithsonian covers a wide range of current and historical topics, and its scope extends far beyond the walls of the museum. During the past year, the magazine published feature articles on a nonprofit air service for environmental groups, the contributions of science to the efforts of the National Transportation Safety Board's air accident investigation team, and a historical profile of Eugen Sanger, Australian aviation pioneer, engineer, and scientist.

Editors and representatives of the magazine attended numerous international conferences and meetings during the year. Their reports on developments worldwide guided editorial planning.

First-time renewal rates have been exceptionally high, and advertising has remained strong. While only a small fraction of total circulation, newsstand sales have been encouraging.

Advice and other aid from the staff of *Smithsonian* magazine have been instrumental in the success of *Air & Space/Smithsonian*.

National Museum of African Art

A year of moving thousands of artworks, installing galleries, publishing exhibition catalogues, and preparing programs for the public culminated with the opening of the new National Museum of African Art on September 28, 1987. With 23,000 square feet of exhibition space—five times more than at its old Capitol Hill site—the museum finally has the opportunity to display its growing collection on a rotating basis to local, national, and international audiences. The elegant museum, capped by a stunning dome-roofed pavilion is a fitting home not only for the museum's exquisite objects of art but also for its nationally recognized research, educational, and archival programs.

Exhibitions

Visitors to the new museum strolled through five distinct, yet interrelated, galleries conceived by museum Director Sylvia Williams and chief exhibition designer Richard Franklin. In all, five inaugural exhibitions showcased four hundred extraordinary examples of African art, each one chosen in relation to the others in the galleries. "African Art in the Cycle of Life," a thematic presentation of African sculpture, featured eighty-eight masterpieces of African sculpture from public and private collections in Europe and the United States. Roy Sieber, associate director for collections and research, and curator Roslyn A. Walker organized the exhibition and wrote the companion publication. The exhibition was supported by an indemnity from the Federal Council on the Arts and Humanities and a generous grant from the Morris and Gwendolyn Cafritz Foundation, which also supported the accompanying volume.

"Objects of Use" consisted of eighty-seven utilitarian and primarily nonfigurative works of art drawn from public and private collections in the United States and from the museum's permanent collection. "The Permanent Collection of the National Museum of African Art" introduced the major cultural and geographic regions of sub-Saharan Africa through 114 works of art selected from the museum collection and twenty-six objects on loan. Both exhibitions were organized by Sylvia Williams and assistant curator Andrea Nicolls.

"Royal Benin Art in the Collection of the National Museum of African Art" included twenty-one objects, spanning the fifteenth to the nineteenth centuries, from the celebrated Kingdom of Benin (Nigeria). The majority of objects were gifts of Joseph H. Hirshhorn to the Smithsonian and were transferred in 1985 from the Hirshhorn



Among the notable acquisitions of the National Museum of African Art this year was a contemporary vessel from Malawi. (Photograph by Jeffrey Ploskonka)

Museum and Sculpture Garden. Assistant curator Bryna Freyer organized the exhibition and wrote the catalogue.

The fifth exhibition, "Patterns of Life: West African Strip-Weaving Traditions," displayed thirty-six strip-woven cloths from a collection purchased by the museum and the National Museum of Natural History. The exhibition and catalogue were prepared by Peggy Stoltz Gilfoy, curator of textiles and ethnographic art at the Indianapolis Museum of Art.

To celebrate the inaugural exhibitions, several special tours and receptions and a dinner were held at the museum in September. In addition, a reception honoring the lenders of objects to the exhibitions was sponsored by the Friends of the National Museum of African Art, a dedicated organization that during the past year doubled its membership to 190.

Acquisitions

The museum's collection grew by forty-eight works of art, including twenty-four that were given as gifts. Particularly noteworthy works of art included a figure carved by the Songye people of Zaire, which was acquired with a combination of donated and acquisition funds, and another carved figure from the Akan people of Ghana, acquired with the assistance of a grant from the James Smithson Society. Gifts included two wooden figures from the Bembe people of the Congo and the Kongo people of Zaire; a kente wrapper composed of twenty-three strips hand-woven by the Akan people of Ghana; a headrest from the Karamajong people of Kenya and eastern Uganda; a mask from the Yaka people of Zaire; and a collection of seven masquettes from the Sisala people of Ghana.

Research and Education

A variety of programs—lectures, workshops, tours, and a symposium—were held in conjunction with the museum's opening. Two weeks before the opening, scholars from Africa, Europe, and the United States gathered to discuss the current state of African art studies at a symposium supported by a grant from the Shell Companies Foundation.

While the museum's doors were closed to the public, the Education Department was conducting outreach programs at schools and for community organizations. It was also training seventy-five docents, who attended sixty hours of workshops and lectures on African art, history, and culture and on interpretive techniques. To further its goal of introducing the American public to African visual traditions, the department published *The Art of West African Kingdoms*. The volume, made possible by a grant from the Shell Companies Foundation, is geared toward teachers at the upper-elementary and secondary levels.

The museum's Curatorial Department published three exhibition catalogues, informational materials for each exhibition, a gallery guide for the permanent collection, and an audiovisual presentation for the exhibition on West African strip-weaving traditions. The Public Affairs Office prepared a general brochure about the museum and an events calendar.

In addition to its collection, the museum offers two excellent resources for staff and visiting researchers: the Warren M. Robbins Library and the Eliot Elisofon Pho-

tographic Archives. Under the leadership of Janet Stanley, the museum's branch of the Smithsonian Institution Libraries carried out a major three-year development program, which was completed during the past year and increased the collection to more than fifteen thousand volumes. The photographic archives has grown tremendously in recent years and now consists of more than sixty collections comprising a total of approximately two hundred thousand images, dating as far back as 1860.

In 1988, Dr. Herbert M. Cole, professor of art history at the University of California at Santa Barbara, will be in residence at the museum. Selected for a Rockefeller Foundation Residency Fellowship in the Humanities, Dr. Cole will be studying archetypes in African art, the subject of a proposed international exhibition and publication at the museum. In addition, a predoctoral fellowship was awarded to Ebenezer Nii Quarcoopome, a graduate fellow from the University of California at Los Angeles who studied West African regalia and patterns of leadership.

The museum's in-house research and conservation work will be strengthened by the new laboratory completed in spring 1987. Besides scientific examination and general care of the collection, the facility and its equipment will allow implementation of a long-range treatment program for copper-alloy sculptures.

In February 1987, Philip L. Ravenhill was appointed the museum's chief curator. Ravenhill supervises the Curatorial Department, which organizes exhibitions, recommends acquisitions, and conducts research on the collection.

National Museum of American Art

The National Museum of American Art (NMAA) continued to strengthen its programs of collecting, exhibiting, studying, conserving, and interpreting American fine art from its beginning to the present. In 1987, new emphasis was placed on the role of the museum's Renwick Gallery in collecting, investigating, and exhibiting American crafts and decorative arts.

Renwick Gallery

The future direction of the Renwick Gallery was clearly decided after a visiting committee of curators, scholars, and artists reaffirmed the gallery's distinguished tradition as a national showcase for American crafts. To enhance the Renwick's performance in this role, the committee, appointed by the Smithsonian's assistant secretary for museums, recommended strengthening programs in research, interpretation, and publication. These and other recommendations were incorporated into a long-range master plan for the gallery, which will continue its relationship as a curatorial department of NMAA.

As a result of the plan, the Renwick has been included as a beneficiary of the Smithsonian's Collections Acquisitions Program, allowing the gallery to strengthen its holdings of contemporary American crafts. In 1987, selected items from this collection were exhibited for the first time in a permanent installation on the second floor of the gallery. Other objects from the collection will be introduced into the exhibition on a rotating basis. Moreover, scholarly endeavors were bolstered by the establishment of the James Renwick Fellowship Program for the study of American crafts and craft history, with funding generously provided by the James Renwick Alliance and the American Craft Council.

The gallery articulated its mission through several successful exhibitions. Perhaps the most significant was "American Art Deco," a comprehensive exhibition of more than two hundred works that was complemented by a major book on the subject published by Harry N. Abrams, Inc., of New York. After closing at the Renwick, the exhibition began a national tour to four other museums. Other exhibitions at the Renwick in 1987 were more specialized and included "Quilts from the Indiana Amish" and "Dan Dailey: Glass, 1972-1987."

Scholarly Activities

At the NMAA, scholarly activities included publication of several works long in preparation. The product of ten

years of research and writing, the six-volume *National Museum of American Art's Index to American Art Exhibition Catalogues, from the Beginning through the 1876 Centennial Year* was published by G. K. Hall & Co., Boston. The volumes contain a vast body of information—where, what, and how often an artist exhibited; artistic fashions and influences in particular geographic locations; the provenance of specific artworks; patterns of collecting; and prevailing attitudes toward religion, history, mythology, and other subjects.

Another long-term project reached fruition when Oxford University Press published the first issue of *Smithsonian Studies in American Art*, NMAA's semiannual scholarly journal. Articles addressed such diverse subjects as the Vietnam Memorial, Thomas Hart Benton, Frederic Church, and James Hampton's *Throne*.

During the past year, NMAA welcomed its first Smithsonian Regents Fellow, Dr. Wanda Corn, Stanford University, who pursued work on American painting during the 1920s. The museum also hosted its first Joshua C. Taylor Fellow, Dr. Richard J. Wattenmaker, director of the Flint Art Institute in Michigan, who conducted research on William Glackens.

Exhibitions

The museum began the year with the exhibition "Modern American Realism: The Sara Roby Foundation Collection," a selection of paintings, graphics, and sculptures from the foundation's earlier gift of 174 artworks. The exhibition's accompanying catalogue was prepared by curator Virginia M. Mecklenburg and published by the Smithsonian Institution Press. "Gene Davis, A Memorial Exhibition," organized by the museum and funded by *The Washington Post*, commemorated the prominent Washington painter and museum commissioner. A series of "Play by Eye" workshops allowed children to create their own striped arrangements à la Gene Davis, who believed children are capable of making visually interesting works. Curator Jacquelyn D. Serwer wrote the exhibition catalogue, which was published by the Smithsonian Institution Press.

Eastman Johnson's painting *The Girl I Left Behind Me* (ca. 1870-75) was among the works of art acquired by the National Museum of American Art in 1987. Except for its exhibition at the Chicago Industrial Exposition of 1875, this work remained in the artist's studio until his death in 1906.



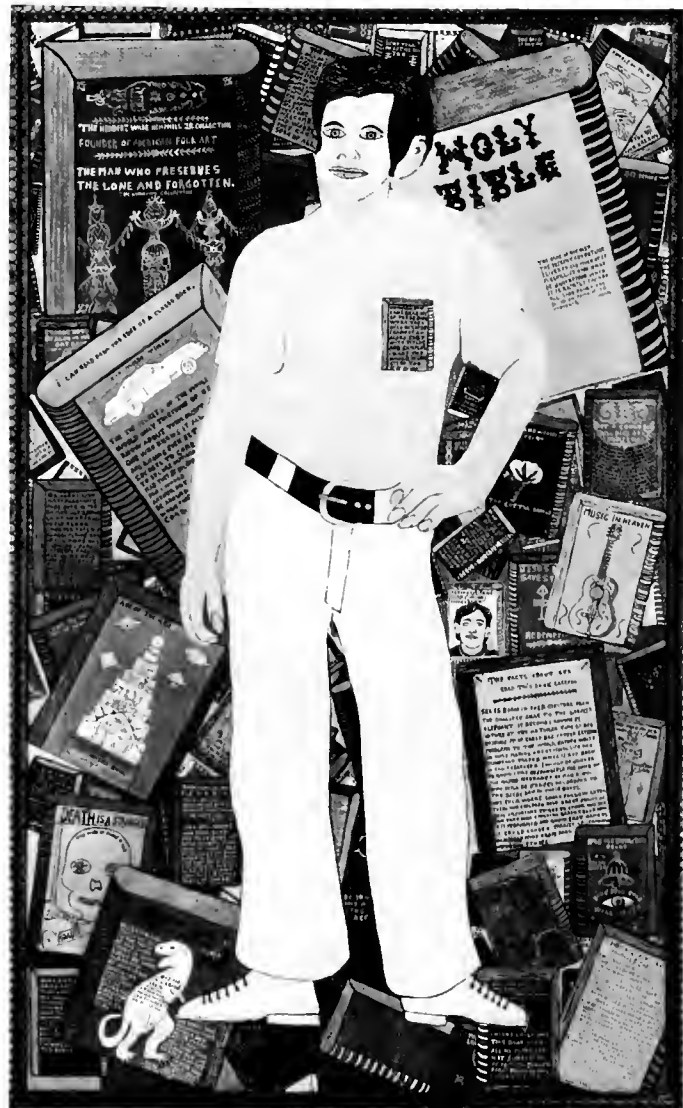
“John La Farge,” organized in cooperation with the Carnegie Museum of Art, was the first retrospective of the innovative nineteenth-century artist in more than fifty years. The 111 pieces in the exhibition, including 10 stained-glass panels, represented La Farge’s work in all media. A companion book featuring essays by six scholars was published by the Abbeville Press. After closing at NMAA, the exhibition will travel to Pittsburgh and Boston. Following a tour of five American cities, “Treasures from the National Museum of American Art,” encompassing eighty-one of the most important works in the collection, returned to NMAA for final installation. The exhibition’s tour was underwritten by United Technologies Corporation.

Other temporary exhibitions at NMAA during the past year included “James Rosenquist: Painting 1961–1985,” for which the artist designed an outdoor billboard and for which a wall, measuring 17 by 46 feet, was erected for Rosenquist’s monumental painting *Star Thief*. “American Traditions in Watercolor: The Worcester Art Museum Collection” surveyed selected nineteenth- and twentieth-century masterpieces from that museum’s renowned collection.

Several exhibitions organized and previously shown by NMAA continued to tour in 1987. These include “Art in New Mexico, 1900–1945: Paths to Taos and Santa Fe”; “Art, Design, and the Modern Corporation: The Collection of the Container Corporation of America”; “The Woven and Graphic Art of Anni Albers”; and “Exposed and Developed: Photography Sponsored by the National Endowment for the Arts.” In addition, the museum lent 142 works from its collection to museums or other institutions in the United States and abroad.

Acquisitions

NMAA enhanced its permanent collection with several major gifts and purchases. The Herbert Waide Hemphill, Jr., collection of 378 American folk art objects, generally acknowledged as one of the finest in private hands in the United States, was acquired from Mr. Hemphill through a joint purchase and gift. This treasury of eighteenth-, nineteenth-, and twentieth-century works includes many examples of quintessentially traditional folk art: weather vanes, trade signs, whirligigs, limner portraits, decoys, painted furniture, ceramics, and theorem paintings. Sculptures, paintings, drawings, collages, and assemblages by twentieth-century self-taught artists are among the other items in the collection. Acquisition of the Hemp-



The Reverend Howard Finster’s *Portrait of Herbert Waide Hemphill, Jr.* was among the 378 folk art objects, dating from the eighteenth century to the present day, acquired by the National Museum of American Art. This collection was a museum purchase and a major gift from Herbert Waide Hemphill, Jr.

hill material signals a significant new direction in the museum’s collecting activities.

Another significant addition was the gift by Patricia and Phillip Frost of their collection of 113 paintings, sculptures, collages, and constructions by American abstract artists of the 1930s and 1940s. These carefully chosen works are a valued addition to the museum’s rich holdings of the works of both famous and lesser-known

National Museum of American History

artists of the period. The Frosts and Mr. Hemphill were awarded the Smithsonian Society's Founder's Medal for their contributions to the museum collections.

Among the 734 works received as gifts in 1987 was a painting purchased by the American Art Forum, which was founded in 1985 to support and enrich the museum's collections. As its first purchase for NMAA, the Art Forum selected John Valentine Haidt's *Young Moravian Girl* (ca. 1755–1760), the only portrait by this artist known to exist outside the Moravian church. In May, the Art Forum convened its second meeting, followed by a special tour of the White House and tea with Mrs. Nancy Reagan, as well as visits to local private collections.

In the area of nineteenth-century paintings, the museum filled a major gap in its collections with the purchase of Eastman Johnson's *The Girl I Left Behind Me*. This enigmatic work of the 1870s remained in the artist's possession until his death in 1906. Other purchases included paintings by Lee Krasner and Elliott Daingerfield and important ceramic pieces by Rudolf Staffel, Rudy Autio, and John Roloff.

In 1987, the museum was given approval to deaccession 56 European paintings, 119 miniatures, a sculpture, and 488 works on paper.

Collections Management

The museum also made significant progress in collections management and in conservation work. In collaboration with the Smithsonian's Conservation Analytical Laboratory, the museum began a two-year technical study of the works of Albert Pinkham Ryder to determine pigments, techniques, and media used. The museum also refurbished its print study rooms and upgraded its storage facilities for works on paper, installing a state-of-the-art compact system that allows 95 percent of the collection to be consolidated into one secure area. Statisticians helped develop a method for random sampling of NMAA's twenty-two thousand works on paper, resulting in the museum's first-ever overview of the Graphic Arts Department's conservation needs. Staff began to appraise the condition of the sculpture collection in 1987; during the first half of the year, fifty-five works were treated.

In other activities, NMAA continued to expand its series of brochures for self-guided tours. The informative publications focus on topics of specialized interest within the permanent collection. "Hispanic-American Art," printed in English and Spanish, allows visitors to discover and appreciate this art in the museum's galleries at their own pace.

The National Museum of American History (NMAH) investigates, interprets, collects, preserves, exhibits, and honors the heritage of the American people. The museum preserves tangible pieces of history—tools, machines, clothing, ceramics, photographs, and countless other material specimens of bygone eras. The physical trappings of yesterday, however, are just one part of the rich tapestry that is America's past. The connective threads are the nation's music, drama, and oral heritage in their myriad manifestations. Reconstructing these more ephemeral elements of the past is also an important part of the museum's mission. The sum of its efforts is research, exhibitions, publications, and public programs that contribute to both scholarly understanding of American history and broad dissemination of knowledge.

The museum's two major curatorial units—the Department of the History of Science and Technology and the Department of Social and Cultural History—consist of seventeen divisions, ranging from community life to electricity and modern physics. NMAH also encompasses the National Numismatic and Philatelic Collections, departments of public programs and exhibits, the Archives Center, and offices of academic programs, administration, conservation, external affairs, and the registrar. Almost every exhibition relies in one way or another on the efforts of staff in each of these units.

Exhibitions

NMAH began the year with its annual exhibition "The Year in Pictures: As Seen from the National Museum of American History," which featured more than fifty pictures of celebrations, demonstrations, and other events around the nation's capital as captured by Smithsonian photographers.

"Engines of Change: The American Industrial Revolution, 1790–1860" opened in November as the museum's second reinstallation of its permanent exhibition halls. The exhibition depicts the evolving industrial society of the nineteenth century, when new machines, new sources of power, and new ways of organizing work transformed the United States from an agricultural nation into a manufacturing power. Two companion publications—one popularized, the other scholarly—build on the exhibition, for which they were named. The in-depth, scholarly treatment of the American Industrial Revolution was written by curator Steven Lubar and senior historian Brooke Hindle.

In February 1987, the museum opened a second major

exhibition, "Field to Factory: Afro-American Migration, 1915-1940." It and an accompanying booklet by curator Spencer Crew chronicled, in rich detail, the "Great Migration," the movement of more than one million Afro-Americans from the farms of the rural South to the cities of the urban North. This mass movement profoundly affected the lives of its participants and fundamentally restructured American society. A version of the exhibition will travel to museums across the country.

Two fascinating exhibitions opened in March 1987. "Beyond Vision," on loan from the Science Museum of London, featured some sixty historical scientific photographs and other images, including reproductions of Wilhelm Roentgen's first X-ray pictures and the first color view of a fetus inside a mother's womb. "Isaac Newton and the *Principia*: Three hundred Years" commemorated the 1687 publication of Newton's *Principia Mathematica* (Mathematical Principles of Natural Philosophy), a cornerstone of modern physics and an important influence in the study of chemistry, electricity, and magnetism.

During the summer, the museum again hosted "Discover Graphics," an exhibition of etchings, lithographs, and other prints by art students from high schools in the Washington, D.C., area. "Superman: Many Lives, Many Worlds," which opened in June, traced the history of the fifty-year-old superhero, as portrayed in comic books, a newspaper comic strip, a television series, feature films, a novel, and on Broadway. Opening in July, "Official Images: New Deal Photography" presented some eighty photographs taken between 1933 and 1941 by government photographers, including Dorothea Lange and Russell Lee. The photographs document the constituencies and policy objectives of five government agencies, rendering a fresh look at the Roosevelt administration's New Deal. A book named for the exhibition was published by the Smithsonian Institution Press and included contributions from curator Peter Daniel of the museum's Division of Agriculture and Natural Resources.

At the close of the year, museum staff completed the thought-provoking exhibition "A More Perfect Union: Japanese Americans and the United States Constitution," which opened October 1. Designed to focus attention on the Bicentennial of the Constitution, the exhibition explores a period when racial prejudice and fear upset the delicate balance between the rights of citizens and the power of the state and led to the internment of some 120,000 Japanese Americans for much of World War II. A section also describes the valor of the men in the 100th Battalion/442nd Regimental Combat Team, an all-Japanese American unit of the U.S. Army. "A More Perfect

Union" is a case study of governmental decision making and citizen action within the constitutional framework.

Research, Scholarship, and Collections

The research and collecting activities of curators and other staff members lay the groundwork for the museum's exhibitions and publications. Such activities are broad ranging and often novel in their approach. For each of the museum's major units, some of the notable developments in these areas during 1987 are highlighted below.

The Department of Social and Cultural History continued its planning and preparations for reinstalling the major exhibition halls in its purview. Under the direction of Keith Melder of the Division of Political History, a team of curators completed an outline for an exhibition on nineteenth-century America, scheduled to open in 1990. In September, the Division of Political History began dismantling the First Ladies Hall, which has been on view since 1964. The division is proceeding with plans for a new exhibition on the same theme, which will open in late 1991. Other efforts under way included a book and 1989 exhibition on "Men and Women: Dressing the Part," both primarily the work of the Division of Costume. Scheduled to open a year later is the exhibition "Parlor to Politics: Women in the Progressive Era."

In November 1986, the Department of Social and Cultural History, in cooperation with the museum's Department of Public Programs, sponsored a two-day conference on American labor history. Proceedings of the conference, which was attended by labor historians, union representatives, and others, were synthesized in a "Radio Smithsonian" program and in a thirty-minute television documentary, called "A Good Job" and produced by the Labor Institute of Public Affairs. A volume of edited conference papers is forthcoming.

Although it is difficult to convey the full range of scholarly interests pursued by the department's divisions, a sampling of lectures given by staff members during the past year provides some indication of the diversity. At the annual meeting of the Society for Historical Archaeology, Regina Blaszczyk, Division of Ceramics and Glass, gave a talk entitled "Coping with an Inferiority Complex: The Movement for 'Better Design' in the American Tableware Industry, 1915-1945." Tom Crouch, chairman of the Department of Social and Cultural History, presented two lectures on "The Custer Legend" to the Harrison County Historical Society in Ohio and spoke on the exhibition



This store in Oakland, California, was closed following the order that forced Japanese Americans out of their homes and into detention camps at the beginning of World War II. The owner, a Japanese American graduate of the University of California, put up the "I am an American" sign the day after the attack on Pearl Harbor. The photograph is featured in the exhibition "A More Perfect Union: Japanese Americans and the United States Constitution" at the National Museum of American History. (Courtesy of the National Archives. Photograph by Dorothea Lange)

"A More Perfect Union" at the Japanese American Citizens League Tri-District Conference in Los Angeles. John Hasse, Division of Musical Instruments, spoke on "Indianapolis as a Leading Ragtime Center" at the Scott Joplin Festival in Sedalia, Missouri. Also during the past year, an essay by Gary Kulik, former department head and now assistant director for academic programs, was published in *The Countryside in the Age of Capitalist Trans-*

formation, which won the E. Harold Hugo-Old Sturbridge Village Memorial Book Award for its contribution to New England rural history.

The Department of Social and Cultural History made several important acquisitions in 1987. These included fifty-one examples of seventeenth- and eighteenth-century English ceramics; a gown owned by Martha Washington; many objects that belonged to Alice Paul, author of the

Equal Rights Amendment and founder of the National Woman's Party; three pioneer typesetting machines designed by Ottmar Mergenthaler; a silver-tipped baton used by John Philip Sousa; and an original movie script for *The Wizard of Oz*.

In the Department of the History of Science and Technology, a new curatorial unit was created to spearhead work on a major upcoming exhibition on the information revolution. One of the first acts of the Division of Computers, Information, and Society was to enter into a precedent-setting agreement with Boston's Computer Museum. The two will collaborate on collections of computer artifacts, prepare a unified list of artifacts, and share expertise in exhibitions. To aid in exhibition planning and development, the division's curators organized several scholarly conferences that gathered experts in economics, philosophy, engineering, history, and business.

Research conducted in the divisions of the Department of the History of Science and Technology led to several publications and many scholarly articles published during the past year. NMAH issued the *Catalog of Geomagnetic Instruments in the Collection of the National Museum of American History* by senior historian Robert Multhauf and Gregory Good, an assistant professor in the Program for the History of Science and Technology at West Virginia University. Also published last year was *The Finest Instruments Ever Made: A Bibliography of Medical, Dental, Optical, and Pharmaceutical Company Trade Literature, 1700-1939* by Audrey B. Davis and Mark Dreyfuss, Division of Medical Sciences. Barbara Melosh, also of the Division of Medical Sciences, received a Regents Publication Award to further her study of gender issues in New Deal art and theater programs. In addition, the department continues to support the publication of three journals on the history of technology: a new periodical, *Rittenhouse: The Quarterly Journal of the American Scientific Instrument Enterprise; Technology and Culture; and Railroad History*.

Acquisitions by the Department of the History of Science and Technology are notable for their variety, historical significance, and novelty. They included a Jarvik-7 artificial heart, important collections of early electronic watches, a collection of Pullman porter artifacts, the complete wardrobe of a female officer in the U.S. Air Force, and a collection of solid-state electronics representing the contributions of Texas Instruments from the transistor era to the present day. "A Material World," a major exhibition opening in April 1988, will focus on the changing role of materials in American culture. Two ac-

quisitions in 1987 hint at the wide-ranging nature of the exhibition—the top-fuel dragster *Swamp Rat XXX* and a 10-ton "Universal Testing Machine," which was shown at the 1893 World's Columbian Exposition and was acquired from Purdue University.

The National Philatelic Collection continued to expand its holdings of three-dimensional objects that portray the movement of the mail and the role of postal service in the development of transportation and communication. Among the acquisitions of the past year was a 1904 screened, horse-drawn mail wagon. Moreover, the collection's staff raised funds to support the continuing restoration of the bus that served as the nation's first Highway Post Office. Donated to the Smithsonian some years ago, the bus was the first in a fleet used across the country from 1941 to 1974.

The National Philatelic Library, the largest of its kind, began to computerize its reference collection of books, monographs, serials, articles, and photographs. Directed by librarian Nancy Pope, the project is using the Smithsonian Institution Bibliographic Information System for information and retrieval. Curator James H. Bruns organized a very successful series of public programs called "Mail in Motion," which detailed the history of postal delivery in American cities, and curator Reider Norby began assembling the library's master collection of foreign postage stamps. Accessions in 1987 totaled sixty-five thousand objects, including a one-dollar postage stamp with an inverted candleholder, of which fewer than one hundred examples are known.

Staff members of the National Numismatic Collection—a large holding of coins, paper currencies, and medals—again were active in international affairs within their field, as well as in research, publishing, and exhibition-related work. Elvira Clain-Stefanelli, Richard Doty, and Cory Gilliland presented papers at the Tenth International Numismatic Congress, which was held in London and organized by the International Numismatic Commission of London and Basel. The commission named Mrs. Clain-Stefanelli an honorary member, and Dr. Doty was elected *member étranger* (foreign member) of the Société Royal de Numismatique de Belgique. Mrs. Clain-Stefanelli also received a silver medal for "excellence in numismatic research and writing" from the Society of International Numismatics, and Mrs. Gilliland was made a fellow of the American Numismatic Society. The collection's staff members wrote eighteen articles and produced three traveling exhibitions in 1987.

Major accessions included a group of exceedingly rare

territorial gold and silver bars and coins; a plaster model for the obverse and reverse of the 1912 buffalo nickel by James E. Fraser; a very rare silver denarius portraying Caius Caesar, a son of Agrippa selected by Augustus to be his successor (20 B.C. to A.D. 3); and a document related to George Washington's first medals, which was written by James Manley in 1791 and signed by Governor George Clinton and the Marquis de Lafayette.

The Archives Center continued to be a busy research facility, serving nearly one thousand visitors and responding to more than four hundred written and telephone inquiries. With the aid of grants from Philip Morris and Miles Laboratories, the center documented the history of the advertising campaigns for Marlboro cigarettes and Alka-Seltzer. Images from the center's extraordinary historical collection of advertisements will be made available as commercial reproductions as a result of an arrangement with the Smithsonian Office of Product Development and Licensing.

In 1987, the Archives Center published guides for the William J. Hammer collection of documents and articles related to the history of electricity and the Carlos de Wendler-Funaro collection of research materials on Gypsies. Major additions to the archival holdings included an outstanding collection of photographs and ephemera of brass bands and a fine set of two hundred documentary photographs of Pittsburgh's Afro-American community in the 1940s.

An office for coordinating the museum's existing relationships with colleges and universities and for cultivating new ties was established in August 1987. The staff of the Office of Academic Programs consists of Gary Kulik, newly named assistant director for academic programs, and Dorothy Jacobs, management services assistant. Even as the office was being formed, the museum and three area universities combined their efforts to lure the American Studies Association, publisher of *American Quarterly*, to the Washington, D.C., area. In a separate action, the museum and the Department of History at American University agreed on the two-year appointment of a historian to be shared by both institutions.

Grants from the Women's Committee of the Smithsonian Associates, the Educational Outreach Program, and the Atherton Seidell Endowment Fund enabled the museum to launch its new American Indian Program. In 1987, the program inaugurated a lecture and performance series. A special outreach effort brought more than five hundred local American Indians to early programs in the series, such as "Traditional Dance and Song of the Sen-



The Howe pin-making machine, the model its inventor submitted to the U.S. Patent Office, and its product, a package of pins. Displayed by the National Museum of American History in its exhibition "Engines of Change: The American Industrial Revolution, 1790-1860," it is one of the oldest surviving operable pieces of production machinery. (Photograph by Eric Long)

eca." The program also sponsored several educational activities and published instructional materials.

The museum's Afro-American Communities Project, which studies antebellum life among free black communities in the urban North, continued to expand its holdings, adding new data from the Black Abolitionist Papers microfilm, a rich source of information on antebellum blacks. During the year, members of the project presented lectures at the Center of the Child at Yale University, the University of Maryland, the University of North Carolina, and New York City's Frances Tavern.

Also during the past year, eighty-three history-museum leaders gathered at a NMAH-organized conference to discuss common needs and problems. The participants proposed measures on criteria for collecting artifacts, exchanging information on collections, increasing ties between academic and museum historians, and improving collaboration between history museums and other organizations. The American Association for State and Local History will publish the proceedings.

The museum also continued to collect, transcribe, and organize the papers of American architect Robert Mills, designer of the Washington Monument. The papers, along with a comprehensive index, will be published in 1988.

Public Programs

The activities of the Department of Public Programs increase the educational value of exhibitions and bring the museum's services and expertise to the nation's schools. In 1987, the department's Division of Education completed a five-year master plan that calls for developing interpretive stations, staffed by volunteers, in each major exhibition area. One such station was opened at the "Engines of Change" exhibition. Other elements of the plan include a program for evaluating exhibitions and audience reactions and perceptions and an outreach project that will entail developing and producing supplementary curriculum materials for nationwide distribution. The department has already started work on three curriculum kits, based on the exhibitions "Field to Factory," "Engines of Changes," and "After the Revolution."

Programs developed by the Performance Division added important artistic and cultural dimensions to the major exhibition "After the Revolution: Everyday Life in America, 1780-1800." The series "American Sampler: Musical Life in America, 1780-1800" featured prominent performers whose presentations realistically demonstrated the vital role of dance and music in the lives of European settlers, African Americans, and Native Americans. As part of the series, a program on Richard Allen, one of the founders of the African Methodist Episcopal Church, traveled to several black churches and community centers. Also in conjunction with "After the Revolution," the museum's Program in Black American Culture organized a conference on "Race and Revolution: African Americans 1770-1830." Twenty-six specialists in Afro-American studies probed issues raised in the exhibition.

The Department of Public Programs is overseeing the museum's Columbus Quincentenary programs, with Lonn Taylor, assistant director for public programs, serving as coordinator. A planning group began work on a major permanent exhibition, "America's Beginnings," which will open in 1992, and on a series of public forums that will lead up to and then complement the exhibition. The first forum, "After Columbus: Encounters in North America," was held in September 1986. An especially appropriate participant in the development of Quincentenary activities is the newly formed Program in Hispanic American History. The program was established to produce a series of educational activities to illuminate the role of Hispanic culture in shaping American history.

Rounding out the department's activities in 1987 were a variety of well-established programs, such as the Chamber Music Series, Jazz in the Palm Court, Palm Court

Cameos, Bandstand Concerts, and America on Film. These programs continued to attract large, enthusiastic audiences.

Behind the Scenes

In any museum, offices seldom in the public view perform invaluable, painstaking work that is absolutely essential to the museum's exhibitions and programs. NMAH's Office of the Registrar, for example, supported the processing and receipt of twenty-four thousand new accessions and more than twenty-two hundred loans for special exhibitions at the museum. In addition, the office tracked the eleven hundred objects that NMAH loaned to other museums and institutions in 1987. To support collections management, general information retrieval, and scholarly research, the office and the curatorial divisions developed the Museum Information Retrieval and Documentation System (MIRDS). Completed last year, the MIRDS handbook culminated a fifteen-year effort.

The Office of the Registrar continued its analysis of space needs in accordance with the museum's long-term plans for reinstalling exhibitions and renovating the building. At the museum's storage complex in Silver Hill, Maryland, work progressed in the asbestos-removal project, as well as in rehousing and conserving objects and in renovating the 16,000-square-foot facility to create a safe environment for sensitive NMAH collections. Integrated into these varied activities are specialized training activities—internships, workshops, tours, and individual consultations—for students and museum professionals. Six high school students from Washington, D.C., participated in a special youth employment program designed to introduce them to museum work. Finally, registrar Martha Morris led a workshop in Port of Spain, Trinidad, on the care of collections, and assistant registrar Katherine Speiss lectured and led workshops in the United States and abroad.

The Division of Conservation surveyed more than fifteen hundred objects in the collections and treated about four hundred in support of exhibitions and loans. Surveys conducted over the last several years have classified some four hundred thousand artifacts in the museum's collections as high priority for treatment. Textiles and costumes received special attention in 1987. Surveys of flags, uniforms, and other textile collections documented conservation needs that exceed present resources. This disparity raised concerns among members of a visiting team of conservators, who recommended conservation-

National Museum of Natural History/National Museum of Man

directed improvements in exhibits and gave high priority to measures for preserving the gowns in the First Ladies Hall. To address this important need, the museum plans to build a laboratory for treating and safeguarding the gowns and the more than forty thousand costumes, textiles, and fragile organic artifacts in other collections.

In 1987, Scott Odell, head conservator, taught a one-week course on the care and conservation of folk art and crafts collections at the Museo Nacional de Artes e Industrias Populares in Mexico City, and he was elected president of the Washington Conservation Guild. Ann Craddock, paper conservator, spoke on safe materials for exhibits and storage cases at the annual meeting of the American Association of Museums. Deputy head conservator Martin Burke helped the Minnesota Historical Society evaluate its collections.

The NMAH Computer Services Center concentrated on expanding the museum's central computer system to support collections, communications to other Institution bureaus and to outside organizations, word processing, electronic mail, and other administrative applications. Following the addition of a second minicomputer to its system, the museum made its first efforts in electronic publishing. Software for computer-aided design was introduced to evaluate its usefulness in exhibition design, conservation, building renovation, and design of storage areas. Program staff developed software to support the Afro-American Index Project, philately collections, textile collections, the Chamber Music Program, and a variety of other programs and activities.

Staff Changes and Appointments

Tom Crouch was named chairman of the Department of Social and Cultural History, succeeding Gary Kulik, who was appointed assistant director for academic programs. The museum's new Program in Hispanic American History is directed by Luz Maria Prieto, who succeeded Pauline Nunez-Morales. Elizabeth Sharpe was appointed deputy assistant director for public programs.



A fossil preparator at the National Museum of Natural History chips away at a rock filled with dinosaur bones. (Photograph by Doc Dougherty)

The National Museum of Natural History/National Museum of Man houses the largest and most valuable natural history and anthropological collections in the world—more than 118 million specimens of plants, animals, fossils, rocks, minerals, and human cultural artifacts. At the disposal of the nation's scientific community, these vast, extensively documented holdings support research on virtually all aspects of the natural world. In 1987, more than two thousand visiting scholars from all over the world used the museum's collections.

To acquire new information and specimens for ongoing research projects, the museum's 113 scientists and 125 resident research associates conduct research all over the globe. In 1987, approximately eight hundred thousand specimens were added to the collections by these expeditions, as well as by gifts, purchases, and deposits by affiliated federal agencies (the U.S. Department of Agri-

culture, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the National Institutes of Health, and the U.S. Geological Survey).

The museum shares the results of its research through exhibitions, educational programs, and the nearly five hundred books, scientific papers, and articles published annually by its staff. In addition, staff-organized symposia and workshops foster the exchange of knowledge among researchers. The museum's exhibitions and complementing public programs, designed to encourage understanding, appreciation, and enjoyment of the natural world, attracted more than eight million visitors in 1987, a record-breaking year.

Highlights of the museum's research, management, and educational activities are described below.

Management Study

In March 1987, after an intensive, six-month study of the museum, McKinsey & Company, Inc., submitted a report analyzing the museum's strengths, weaknesses and organizational effectiveness. The report, *A Management Agenda*, recommended changes in strategic planning, development, communication, and organization. The management firm's recommendations are being used to help define the museum's goals for the next decade and to establish a management plan to accomplish these goals. Museum Director Robert S. Hoffmann appointed eleven task forces to develop specific recommendations for implementing the report's findings, including the establishment of a development office and a national advisory board.

Inventorying Tropical Biodiversity

Amazonia is the most biologically diverse area on Earth. But this ecological treasure is diminishing, threatened on all sides by human encroachment. Scientists and conservationists fear that vast numbers of plant and animal species will be destroyed before researchers can even identify them, let alone study them for their potential value to humanity.

In 1987, the museum began a systematic inventory of the rich crescent of tropical and subtropical plant and animal life in the western and northern reaches of Amazonia, from the flanks of the Andes to the Guianas. A multidisciplinary team of Smithsonian scientists and their host-country colleagues are focusing initial efforts in the

Biodiversity Program on two large expanses of virgin subtropical Amazonian forest—the Beni Biosphere Reserve, Bolivia, and the Manu Reserved Zone, Peru. The biodiversity project is supported by funds from the U.S. Congress and by grants from the U.S. Agency for International Development, the World Heritage Program, and the Man and Biosphere Program of the United Nations Educational, Scientific, and Cultural Organization.

Led by museum entomologist Terry Erwin and project manager Francisco Gomez-Dallmeir, the biotic inventory is expected to identify thousands of yet-to-be-discovered insect species, hundreds of new plant species, and dozens of still-unknown animal species. This accounting of Amazonia's flora and fauna is likely to yield new sources of food, biological control agents, and germplasm resources.

Over the next decade, the museum plans to initiate similar inventory projects in several other locations in Amazonia, including sites in Ecuador, Colombia, and Venezuela. As the program expands, hundreds of students and young professionals will receive scientific training in conjunction with inventories in their own countries.

Two other long-standing museum projects in Latin America complement the Biodiversity Program. In one, the museum and five other sponsoring organizations are engaged in a multinational effort to analyze the plant life of Surinam, Guyana, and French Guiana—a region of tropical America that has received little botanical attention. Under the direction of botanist Laurence Skog, more than a dozen museum scientists are participating in the project, which also involves scientists from the Guianas, the Berlin Botanical Garden, the Musée National d'Histoire Naturelle in Paris, the University of Utrecht in the Netherlands, and the French research agencies in French Guiana. One of the project's aims is to determine which areas in the Guianas merit protection on the basis of their biotic diversity.

In the other Latin American research project, museum scientists are studying biotic diversity in Brazil's Atlantic forests and in its tropical lowlands of the Amazon basin. Over the past decade, the researchers have been determining what plant and animal species inhabit the regions, as well as the origin, distribution, and relationships of these species. The studies are being coordinated with archaeological investigations of early human culture in Amazonia. In connection with these efforts, the Smithsonian and the Brazil Academy of Sciences organized a workshop on "Neotropical Biotic Distribution Patterns," which was held in Rio de Janeiro in January 1987. Mu-

seum scientists who presented papers at the workshop were Erwin, anthropologist Betty Meggers, and zoologists Richard Vari, W. Ronald Heyer, Stanley Weitzman, and Marilyn Weitzman.

American Indian Outreach Program

Anthropologist JoAllyn Archambault joined the Department of Anthropology in 1987 as director of the museum's activities in the new interbureau Native American Program. This program is designed to make Smithsonian resources more accessible to Native Americans and to increase their involvement in the Institution's programs, particularly those related to Native American history and culture. As one of her first outreach projects, Archambault organized an exhibition that explored the relationships between nineteenth- and twentieth-century Plains Indian art.

New Ethnographic Series

Museum anthropologists William L. Merrill and Ivan Karp have begun a new Smithsonian Institution Press series devoted to publishing analyses of societies throughout the world. By the end of 1987, seven works were published in the series. Upcoming publications will include a treatise by Merrill on knowledge and social processes among the Rarámuri Indians of northern Mexico. The Press also will publish a collection of essays, edited by Karp, on African concepts of power and authority and the manifestation of these concepts in rituals, cosmology, and cults.

In related endeavors, museum ethnologist Mary Jo Arnoldi studied the role that drama plays in shaping the identities of youths in Mali's community of Bamana people. As part of her research, Arnoldi is documenting the changes that Mali youth drama has undergone in both form and content over the last century. Her examination of the characters in the dramas of the colonial and post-colonial eras has identified key issues of past and present generations.

Exploring a Unique Atoll

Remote and uninhabited Henderson Island, a day's voyage away from Pitcairn Island of *Mutiny on the Bounty* fame, is the only elevated South Pacific atoll that remains



National Museum of Natural History Director Robert S. Hoffmann and Assistant Director Stanwyn Shetler presenting cartoonist Gary Larson with the museum poster for the Larson exhibition.

essentially undisturbed by humans. Surrounded by vertical and undercut cliffs and supporting a nearly impenetrable forest, the small atoll has been visited by only a handful of scientists.

In April 1987, a Smithsonian-sponsored expedition conducted a nine-day reconnaissance of Henderson Island. The visit was a particularly timely one. Pressure to develop the atoll is increasing, adding urgency to calls to protect the tiny land mass as an "Island for Science." The Smithsonian team, which included museum entomologist Wayne Mathis and museum ornithologist Gary Graves, conducted the first survey of the island's unique flora and fauna. The researchers gathered the preliminary data needed to formulate a proposal for a full-scale ecological survey to document the case for the atoll's preservation in its undisturbed condition.

Museum staff members were involved in several other international expeditions in 1987. In March, the museum mounted its fifth research mission to Aldabra Island, an atoll in the Western Indian Ocean. Studies were conducted by zoologists Brian Kensley and Kristian Fauchald and museum specialists Marilyn Schotte and Janice Clark. Before the expedition, an international workshop was held at the museum to update scientists and conservationists on the museum's work on the island, which is

a sanctuary for unique plant and animal species, including the only surviving colony of the Indian Ocean giant tortoise.

On the coast of central Labrador in eastern Canada, a museum archaeological survey led last June by anthropologist William Fitzhugh discovered Eskimo and Indian sites occupied at various times between eight thousand and two hundred years ago. Studies of these sites are expected to shed new light on the complex cultural history of this northern maritime region.

In February and March, botanist Robert W. Read conducted field studies in the Hawaiian Islands to determine the status of several endangered species of the palm genus *Pritchardia*. Of the eighteen species believed endemic to the islands, Read found two in immediate danger of extinction in the wild. He determined that the greatest threat to the survival of most of the endemic palm species is the destruction of seeds and seedlings by rats and pigs.

Museum Director Robert S. Hoffmann, who in August was appointed assistant secretary for research, effective January 3, 1988, and research associate Dr. Richard M. Mitchell participated in a United States–Chinese survey of mammals and birds of the Tibetan Plateau. The expedition, a cooperative venture involving the museum, the Chinese Academy of Sciences, and the American Ecology Institute, was focused on a remote region that has been explored scientifically only once—at the turn of this century. Among the highlights of the survey was Dr. Hoffmann's rediscovery of a rare species of shrew, known previously from a single documented specimen.

In Kenya, physical anthropologist Richard Potts continued excavations at the 700,000-year-old Olorgesailie Lake basin. The area has yielded numerous stone tools and animal bones, which some anthropologists believe are markers of hominid "home bases." Potts excavated the skeleton of a now-extinct form of elephant. Nearby stone axes suggested that the skeleton was found at the site where the elephant was butchered.

Catastrophic Extinctions Investigated

Concern over the potential for a massive decline in biotic diversity wrought by tropical deforestation has prompted scientists to study how terrestrial ecosystems have responded to catastrophic changes in the past. The museum's newly organized Evolution of Terrestrial Ecosystems Program—coordinated by paleoanthropologist Richard Potts and paleobiologists Anna K. Behrensmeyer, John D. Damuth, William A. Dimichele, and

Scott L. Wing—is addressing this question by gathering data on the disruption and continuity of ecosystems from four hundred million years ago to the present. As a first step toward assessing current understanding of ancient terrestrial ecosystems, the museum convened an international conference in May 1987. Thirty-five paleoecologists from the United States, Canada, England, and West Germany participated in the meeting, the first ever devoted to this subject. The data assembled by this long-term program will add a much-needed historical perspective to the museum's ongoing biodiversity studies.

Punctuated-Equilibrium Model of Evolution

Past studies of rates of evolution focused on changes in single morphologic characters, such as body size, or on tracing the persistence of species through geologic time. Today, thanks to the combination of computers and multivariate statistical techniques, numerous characters can be evaluated simultaneously to assess evolutionary changes in overall structure and form of organisms.

Museum paleobiologist Alan H. Cheetham is using this powerful combination of tools to study evolutionary patterns in bryozoans that lived in the Caribbean region during the Miocene and Pliocene epochs, seven million to thirty-eight million years ago. He examined fossils of the small aquatic animals in closely spaced strata, averaging about 150,000 years apart over an interval of about 4.5 million years. Cheetham found that within each of the nine species of the bryozoan genus *Metrarabdotos*, changes in overall morphology were too slow and too discontinuous to account for the emergence of distinct species. The results of Cheetham's study provide additional evidence in support of the punctuated-equilibrium model of evolution, which holds that periods of geological history are marked by events that induced rapid evolutionary change and the emergence of new species, followed by other long periods of little or no change.

Volcano Studies

To commemorate the seventy-fifth anniversary of the Hawaiian Volcano Observatory, the museum republished the complete series of *The Volcano Letter*, a historic, hard-to-find reference published by the observatory from 1925 to 1955. The fifteen-hundred-page volume contains definitive reports on many Hawaiian eruptions and vol-



Bull Moose, a painting by Robert Bateman, was exhibited at the National Museum of Natural History along with numerous other works by the artist.

canic activity around the world over the the thirty-year life of the letter.

In 1987, museum studies of volcanic phenomena included an ongoing investigation of how debris ejected by a submarine volcano sinks to the sea floor. Museum volcanologist Dr. Richard Fiske and his colleagues from the University of Tokyo and Princeton University are conducting the study.

To test his theory of how particles erupting from submarine volcanoes settle, Fiske designed a 30-foot-long, scuba-operated settling tube with trays at the bottom. Preliminary experiments conducted with this apparatus at the Smithsonian Marine Station at Link Port, in Fort Pierce, Florida, confirmed Fiske's theory—particles falling

to the sea floor tend to be partitioned into deposits of telltale texture containing dense rock fragments that are only about one-tenth the size of the associated low-density pumice. Ongoing field research in Japan is also proving that submarine rocks with such characteristic textures are common in the geologic record.

Quincentenary Activities

Distinguished scientists from the United States and Canada debated the issues and controversies arising from questions concerning the first human occupation of the Americas. The occasion for the debate was the public

symposium "Americans before Columbus: Ice Age Origins," organized by the museum and the Smithsonian International Center. The September symposium was the first of six Quincentenary symposia to be held through 1992 to promote scholarly and public understanding of significant issues related to Columbus's first voyage to the Americas. In conjunction with the program, the museum featured a special exhibit on the work of museum anthropologist Dennis Stanford, who is investigating the origins, spread, and development of early humans in the New World.

In addition to the symposia, the museum's Quincentenary activities, coordinated by museum historian Herman Viola, director of Quincentenary Programs, will include "Seeds of Change," a major exhibition scheduled to open in 1991.

Collections Management

The museum continued to give high priority to developing a fully automated Collections Information System. In 1987, a prototype system was set up in the museum's Fish Division. The result is more efficient use of the division's collections, aiding scholarly research and increasing the ability of managers to maintain accountability over collections.

National Cancer Institute Agreement

As a result of a 1987 agreement with the National Cancer Institute (NCI), the Smithsonian Oceanographic Sorting Center, which is administered by the museum, will house and curate a voucher collection of nearly ten thousand marine plant, invertebrate, and fish specimens. Duplicates of those being tested by NCI for anticancer substances, the specimens will be housed in the sorting center's collection at the Smithsonian's Museum Support Center. They will be available for study by scientists from the museum and other institutions.

Plans for Marine Station Laboratory

A long-term lease agreement was signed in June 1987 by Seward Johnson, Jr., chairman of the board and president of the Harbor Branch Oceanographic Institution, Inc., and Smithsonian Secretary Robert Adams. Leasing of the 1.2-acre plot clears the way for museum plans to

seek private funds to support construction of a new laboratory at the Smithsonian Marine Station at Link Port in Fort Pierce, Florida. The new building, which will include living quarters for scientists and will be built entirely with contributions from private donors, is badly needed and will increase the range of studies undertaken at the facility.

Exhibitions

"Portraits of Nature: Paintings by Robert Bateman" (January 17–May 17) led off the museum's 1987 special exhibition schedule. This major retrospective of works by the Canadian painter, regarded as one of the world's foremost wildlife artists, featured more than one hundred paintings that celebrate nature's diversity. Many had never been exhibited in the United States. Organized by the museum, the exhibition drew more than 275,000 visitors to the Thomas M. Evans Gallery during its four-month run and was a major factor in the museum's record-breaking attendance in 1987.

In conjunction with the Bateman exhibition, the Smithsonian Institution Press published *Portraits of Nature: Paintings by Robert Bateman*, by museum botanist and assistant director Stanwyn Shetler. Illustrated with many of the works that appeared in the exhibition, the book interprets Bateman's paintings from the perspective of a naturalist and explains why his work has become a powerful influence on the worldwide conservation movement.

"Ebla to Damascus: Art and Archaeology of Ancient Syria," a major exhibition organized by the Smithsonian Institution Traveling Exhibition Service in cooperation with the Syrian Directorate of Antiquities, opened on July 10 in the Thomas M. Evans Gallery for a five-month run. On display were 281 statues, inscriptions, mosaics, jewelry, and other artifacts uncovered by recent archaeological research. The objects demonstrate the cultural significance of the region that comprises present-day Syria and shed light on the region's influence on the development of Western civilization.

"American Bird Sculpture: Decoys to Decoratives" (January 29–April 30) traced the development of a distinctive North American art form, featuring one hundred bird carvings from the North American Wildfowl Art Museum of the Ward Foundation in Salisbury, Maryland. During the exhibition, award-winning decoy carvers from Maryland and Virginia gave demonstrations of their craft.

"The Far Side of Science" (April 9–May 31) displayed

five hundred of Gary Larson's best "Far Side" newspaper cartoons. Poking fun at a wide range of natural history topics—from evolution to prehistoric man—these works offered hilarious and insightful twists on both human behavior and the human view of the natural world.

Preparing dinosaurs for museum display has been a Smithsonian specialty for nearly a century. In 1987, the museum opened an exhibition that, for the first time, shows the public how the ancient animals are assembled from fossilized remains. Through a window, technicians in a laboratory can be seen chipping away a 10-ton slab of rock that contains the bones of *Coelophysis*, a small 220-million-year-old dinosaur. Over the next two years, a complete skeleton of the two-legged reptile with a bird-like skull will be removed from the block of New Mexican sandstone and mounted in a lifelike pose. A closed-circuit camera equipped with a zoom lens allows visitors to view details of the work on TV monitors.

Artistic renderings of dinosaurs were presented in two of the museum's exhibitions in 1987: "Dinosaurs Past and Present" and "Dinosaurs, Mammoths and Cavemen, The Art of Charles R. Knight." Other exhibitions included "From Love of Nature," which featured paintings of plants and animals in Brazilian forests by Etienne, Rosalia, and Yvonne Demonte; "Mountain Light," a display of Galen Rowell's color photographs of some of the world's highest peaks and of the human and wildlife inhabitants of these rugged areas; and "On China: Photographs by Hiroji Kubota."

"The Magnificent Voyagers," the museum's acclaimed 1985-1986 exhibition, began a three-year tour of major museums and historical societies across the United States. An educational packet containing information about the exploring expedition—a landmark in the annals of science and U.S. naval history—is being distributed to schools nationwide. In addition, the Office of Education prepared a fifty-two page, slide-illustrated instructional guide to the exhibition.

Also in conjunction with "The Magnificent Voyagers," the museum commissioned and premiered two one-act plays about famous American explorers. *Stormy Petrel* was a portrait of Captain Charles Wilkes, and *A Brave Man's Part* focused on John C. Fremont and his wife, Jessie.

During 1987, the Office of Education presented a variety of other programs for students, families, and teachers, as well as for museum visitors in general. Under the office's direction, an instructional kit, *The Living Arts of India*, was completed and distributed to secondary schools, universities, and museums in the United States

and, through the United Nations Children's Emergency Fund, in India. The kit consists of a three-hundred-page teachers' manual, four supplemental manuals, a videotape, and three audiotapes.

Special museum programs commemorated Black History Month and Hispanic Heritage Week. A special exhibition, "Micronesia: New Islands in a Vast Sea," was developed as part of the museum's observance of Asian-Pacific American Heritage Week.

Members of the Office of Education organized more than three dozen workshops for teachers and museum educators in Washington, D.C., and in communities across the nation. Moreover, the staff made presentations to more than five thousand students in Washington, D.C., area schools.

The Discovery Room, a special exhibit area where visitors can touch and examine natural history objects, hosted more than one hundred thousand visitors in 1987. The Naturalist Center, which celebrated its tenth anniversary, was visited by seventeen thousand amateur scientists, students, teachers, artists, and collectors. Thirty-nine film programs and seventeen lectures were featured in the Office of Education's Friday film and lecture series.

"Butterflies and Their Flowers," the fifth in a series of charts on plant and animal identification, was published in collaboration with the National Zoological Park. The educational charts are used in classrooms, clubs, nature centers, libraries, and homes.

National Portrait Gallery

The National Portrait Gallery chronicles America's past through artists' portrayals of the nation's leaders in politics, the arts and letters, and business; noted scientists; folk heroes; sports greats; and the many others—the celebrated and the unjustly forgotten—who have left their imprints on U.S. history. Through its permanent collection and its special exhibitions, the museum offers the American public a fascinating look at the people who have shaped their country.

Exhibitions

A major reinstallation of the National Portrait Gallery's permanent collection was completed in 1987. As a result, the museum's galleries are arranged more logically and many recently acquired portraits have been placed on permanent view for the first time. The first floor is now home to portraits of notable actors, singers, musicians, and writers of the twentieth century. The mezzanine level is devoted to the Civil War era, and the second floor features the Galleries of Notable Americans from 1600 to present. These period galleries surround a central area where portraits of contemporary artists and writers are placed.

Upon completion of the reinstallation in May, the museum opened the special exhibition "Stage Portraits: Photographs of Mathew Brady from the Frederick Hill Meserve Collection." "TIME: Man of the Year," which also opened during the past year, was the latest in a series of shows based on original artwork donated to the gallery by the magazine. "The Art of Henry Inman," organized by guest curator Dr. William Gerdts, featured more than one hundred works, the first such exhibition of Inman's paintings since his death in 1846. Included among the works was the artist's portrait of Angelica Singleton Van Buren, never before exhibited outside the White House.

"Portraits from the American Academy and Institute of Arts and Letters" displayed images of key figures in the worlds of art, music, and literature from the collections of the academy, which will show the exhibition in fall 1987 at its New York City headquarters. As an expression of its ongoing interest in caricature art, the gallery also featured "Like and Unlike: Caricature Portraits by Henry Major and Herman Perlman." The exhibition showcased amusing likenesses of many celebrities and leaders from the period between the two world wars. Two exhibitions of recent acquisitions were also mounted in 1987.

The American Art/Portrait Gallery Library continued its modest, but active, exhibition program in 1987. Notable among last year's efforts was "Highlights from the Downtown Gallery." The exhibition commemorated the sixtieth anniversary of the founding of New York City's Downtown Gallery, well known for its emphasis on bringing the work of living American artists to the people.

The museum's staff devoted much time and effort to creating an exhibition of about fifty paintings representing the last one hundred years of American portraiture. The exhibition was commissioned by the U.S. Information Agency as part of a cultural accord between the People's Republic of China and the United States. The showing in China, however, was canceled as the result of a disagreement between the two governments. The exhibition is now scheduled for a showing in Hong Kong and, possibly, Japan.

In 1987, nearly two hundred items from the museum's collection were on temporary or long-term loan to institutions across the country and to other Smithsonian bureaus. Major loans were made to the Library of Congress and the Daughters of the American Revolution Museum in Washington, D.C.; the New York Public Library; and the Huntington Galleries in West Virginia.

Acquisitions

The most important painting added to the collection in 1987—and, indeed, one of the most significant acquisitions in the museum's twenty-five-year history—is the splendid portrait of Benjamin Franklin painted by J. S. Duplessis in 1785. The portrait was a gift from the Morris and Gwendolyn Cafritz Foundation. Other significant gifts to the gallery included portraits of Admiral and Mrs. George Dewey by Theobald Chartran; nine original plaster busts by Jo Davidson; paintings of David Sarnoff, William B. Astor, George F. Bristow, and John Howard Raymond; and a sculptured head of Gardner Cox. Through purchase and gift, the gallery procured a portrait of James Jones by Bernard Childs and a portrait of Rubens Peale by his brother Rembrandt Peale. The museum's portrait collection was also enhanced by purchases of several significant paintings, including portraits of Wil-

George Dewey by Theobald Chartran, oil on canvas. Bequest of Frederick McLean Bugher to the National Portrait Gallery. (Photograph by Eugene Mantie)



liam Pitt Fessenden, by Constantino Brumidi; of Dr. Helen Lynd, by Alice Neel; and of Patience Wright, the first American woman sculptor. The presidential portrait series benefited from the purchase of a life portrait of Andrew Johnson by Washington Bogart Cooper.

The gallery received a major gift of 107 drawings by Samuel J. Woolf, which was enhanced with purchases of the renowned portrait illustrator's drawings of Justice Louis Brandeis, Charles Lindbergh, and Dr. Alexis Carrel. Watercolors purchased include Thomas Nast's rendering of President Ulysses S. Grant and one of Edwin Austin Abbey by "Spy" (Sir Leslie Ward). In the area of caricature, the museum acquired four early works by Al Hirschfeld, a drawing of John Dos Passos by Adolf Dehn, three drawings by William Sharp, and three paintings by Thomas Nast, which included a representation of poet William Cullen Bryant. Posters representing Buster Keaton, Rita Hayworth, and Rudolph Valentino—made in France, Italy, and Belgium, respectively—were purchased, as were an American six-sheet poster of James Cagney and an exceptional image of Buffalo Bill Cody.

Major purchases of photographs included vintage portraits of Gertrude Stein by Man Ray, Dwight David Eisenhower by Richard Avedon, Jack Kerouac by Robert Frank, and Walter Philip Reuther by Josef Breitenbach, as well as a unique calotype negative of Matthew Calbraith Perry by an anonymous photographer and a daguerreotype of Franklin Pierce by Albert Sands Southworth and Josiah Johnson Hawes. Among gifts to the museum were a hitherto unknown daguerreotype of Jefferson Davis and a collection of original manuscript materials relating to the final years and death of Mathew Brady. The museum also initiated the transfer, from the Dibner Library, of a major album of salt-print portraits of President James Buchanan, his vice-president and cabinet, and the leading members of the U.S. Congress during Buchanan's administration. The album is an extremely important pictorial document of American politics on the eve of the Civil War.

Research and Education

Work on the museum's Catalog of American Portraits, an expansive computerized collection of portrait data, progressed in 1987. Staff members added major collections in Richmond, Virginia, and New York City. Progress also was reported in the transcribing, researching, and annotating of selected letters and documents of Charles Willson Peale and his sons, Raphaele, Rembrandt, and

Rubens. The series' second volume, *Selected Papers of Charles Willson Peale and His Family: The Artist as Museum Keeper, 1771-1810*, will be published by Yale University Press in December 1987. The manuscript for the third volume, *The Artist in Retirement, 1810-1820*, is scheduled to be delivered to Yale in spring 1988.

In conjunction with its exhibition schedule, the museum published catalogues for "The Art of Henry Inman" and "Portraits from the American Academy and Institute of Arts and Letters." Brochures were produced for "Like and Unlike: Caricature Portraits by Henry Major and Herman Perlman" and "TIME: Man of the Year."

The museum's public education program continued to combine a daily schedule of tours with an array of outreach programs for elementary and secondary schools and for senior citizens. Continuing programs produced by the Education Department include "Portraits in Motion" and its spinoffs, "Portraits in American Jazz," "Portraits in American Song," and "American Voices." In collaboration with the Resident Associate Program, the department organized "Six Evenings with America's Premier Authors and Artists." Now well established, the Lunchtime Lecture series and Speakers Bureau services attract large audiences.

The curator of education and the curator of prints combined their efforts to produce a valuable teachers' guide. Published in 1987, *Private Lives of Public Figures* introduces a new audience to a popular nineteenth-century portrait tradition.

Office of Exhibits Central

The Office of Exhibits Central supports the Smithsonian's exhibition programs by providing exhibit-related services throughout the Institution. In 1987, the office completed more than three hundred projects, serving nearly every unit in the Institution. Services ranged from exhibition design and script writing and editing to production of entire exhibitions, involving such tasks as woodworking, model making, bracketing, taxidermy, packing, and silk screening. The projects highlighted below illustrate the diversity of the office's activities.

Among the nearly twenty exhibitions the office produced for the Smithsonian Institution Traveling Exhibition Service (SITES) was "Russia, The Land, The People: Russian Painting, 1850-1910." Under the supervision of Russian conservators, office staff removed each of the sixty-five paintings from their frames, added a spacer to the stretcher, and then reframed the artworks under Lexan. Staff members also developed accompanying graphics and installed the exhibition at the Renwick Gallery. Other projects accomplished for SITES in 1987 included design, editorial, and production work for "Gauguin and His Circle in Brittany: The Prints of the Pont-Aven School," "The Golden Age of Dutch Painting from the Collection of the National Gallery of Ireland," and "Child to Child: American-Soviet Children's Art Exchange."

The Model Shop was especially busy during the past year. For the National Museum of American History's exhibition "Field to Factory," six life-size, fully detailed mannequins were created from shop-made lifelike casts of faces, hands, and feet. The shop also built a 6-foot scale model of the fernery at Philadelphia's Morris Arboretum. Created for the Smithsonian Office of Horticulture, the model—replete with miniature ferns—was exhibited at the Philadelphia Flower Show and at the Chelsea Flower Show in London, England.

Applying its expertise in conservation, the office's Graphics Unit mounted, matted, and framed original works on paper for the SITES exhibitions "Child to Child: American-Soviet Children's Art Exchange" and "John Held's America: Flappers, the Jazz Age, and Beyond." The unit also silk-screened text panels and labels for these and other exhibitions.

The Fabrication Unit was involved in nearly every office project, constructing panels, vitrines, and customized shipping containers. In addition, the unit built thirty-five pedestals for the National Portrait Gallery and replaced damaged vitrines for the Hirshhorn Museum and Sculpture Garden.

One of the office's more novel projects in 1987 was the

exhibition "Roads to Liberty: From the Magna Carta to the Constitution." Working through the Office of the Secretary and in support of the Commission on the Bicentennial of the U.S. Constitution and the U.S. Constitution Council, the office designed, produced, and installed the exhibition in a customized tractor-trailer truck. The exhibition was seen in 134 cities, ending its tour in Philadelphia on the anniversary of the signing of the Constitution.

Office of Horticulture

The Office of Horticulture is responsible for a full range of horticultural services, including maintenance of the grounds around the museums, interior plantings, and educational activities such as tours, lectures, and seminars to local, national, and international groups.

Notable among the office's accomplishments during the past year was the completion and opening, on May 21, 1987, of the 4.2-acre Enid A. Haupt Garden, the verdant crown atop the Institution's new underground museum complex. True to the wishes of the garden's donor and namesake, Enid Annenberg Haupt, the office's staff achieved a "mature" look, planting tree specimens as tall as 25 feet. Interspersed among beech and weeping cherry trees, saucer magnolias, boxwoods, thornless hawthorns, yews, American hollies, and other trees and shrubs are about one hundred cast-iron garden benches, settees, urns, and chairs from the office's collections. The garden was featured in the July 1987 issue of *Smithsonian* magazine and has attracted considerable attention from other publications.

Also in 1987, the Office of Horticulture participated in flower shows in New York City, Philadelphia, and Washington, D.C., and received awards for exhibits of exceptional value. At the Philadelphia Flower Show, for example, the office's scale model of the nineteenth-century fernery on the grounds of Philadelphia's Morris Arboretum won a special award for exceptional merit. The fernery, made in collaboration with the Office of Exhibits Central, was loaned to the Morris Arboretum for its exhibition at the Chelsea Flower Show in London, England. The office again organized the annual "Trees of Christmas" exhibition, now in its tenth year. The successful exhibition benefited greatly from the efforts of hundreds of volunteers—families, crafts groups, and individuals from around the nation—who contributed their handmade ornaments.

Supplementing its educational programs for the public, the office began developing a program of docent-led tours of the Smithsonian's gardens and grounds, the greenhouse-nursery, and the office's exhibits. In 1987, the office provided training for seven student interns, and it cosponsored two lectures and demonstrations. One featured Joseph Smith, who demonstrated Western-style flower arranging. In the other, Akihiro Kasuya gave a presentation on Ikebana, or Japanese-style flower arranging.

For the Office of Product Development and Licensing (OPDL), James R. Buckler, director of the Office of Horticulture, served as editor of *Gardener's Journal*, a publication highlighting monthly activities in indoor and



Opening ceremonies for the Smithsonian's new museum and garden complex on the Mall, September 28, 1987. Visitors flank the Enid A. Haupt Garden, which boasts a Victorian parterre, shown here planted with thousands of pansies. (Photograph by Jim Wallace)

outdoor gardening. In addition to his other duties, Mr. Buckler gave lectures to groups around the nation.

The office's holdings benefited from the donation of a unique collection of 250 bouquet holders and related horticultural memorabilia, a gift from Mrs. Frances Jones Poetker of Cincinnati, Ohio.

In other activities, the director and Mrs. Kathryn Meehan, museum specialist working with OPDL, engaged in negotiations with Brown-Jordan, a firm interested in manufacturing reproductions of furniture in the Smithsonian's indoor and outdoor gardens. In May, the office hosted a reception for the Garden Club of Bavaria, Germany.

Office of Museum Programs

The Office of Museum Programs is an outreach arm of the Smithsonian, offering a growing array of professional development services to museums in the United States and throughout the world. The director of the office is Jane R. Glaser.

More than five hundred museum professionals participated in office-organized workshops that were held at the Institution in 1987. Coordinated by James Quinn, the series of in-depth workshops addressed a total of twenty-seven topics essential to museum operations, as presented by office staff members and by experts from other Smithsonian bureaus and from other organizations. New in 1987 was a five-day pilot program that focused on improving teaching skills. Participants were Smithsonian staff members.

The office also presents workshops at other institutions, which are organized by Patricia Barrows in collaboration with state, regional, national, and international groups. Among the fifteen on-site workshops held during the past year were model training programs offered in Trinidad/Tobago and Costa Rica, which were cosponsored by the Organization of American States.

Through its Internships in Museum Practices Program, directed by Bruce Craig, the office placed more than fifty U.S. and foreign students and museum professionals in Smithsonian bureaus, where the participants were trained in collections management, curatorial tasks, and other museum duties. An additional one hundred museum professionals participated in the program's short-term training sessions. Special seminars on museum practices were organized for visiting groups from Spain, France, and the People's Republic of China. In addition, staff members continued their involvement in two successful annual programs. With the U.S. Information Agency, program staff coordinated the fourth annual project on Museum Management, which attracted twelve museum directors, representing nine European nations. Thirty-four museum interns attended the seventh annual "Museum Careers Seminar," an eight-week program in which professionals from the Smithsonian and other Washington, D.C., area museums serve as instructors and discussion leaders.

The Audiovisual Program, which produces and distributes instructional videotapes and slide-cassette programs, neared completion of several important teaching materials. Productions soon to be released are *Connoisseurship in the Visual and Decorative Arts: The Educated Eye*, *Horticulture in a Museum Setting*, *Museum and Community*, and *More than Meets the Eye*. The program, which is coordinated by Laura Schneider, also began distribut-

ing a videotape and handbook on services for disabled museum visitors, which was prepared by the Smithsonian's Office of Elementary and Secondary Education.

Now a decade old, the Native American Museums Program, headed by Nancy Fuller, the office's assistant director, continued to support the efforts of American Indians, Inuits, and Aleuts to preserve their heritage through the creation of tribal museums and cultural centers. The program offers internships, provides technical assistance, and publishes instructional materials. In conjunction with the International Research and Exchanges Board, the office coordinated a three-week trip by four museum specialists, two of whom are American Indians, to East Germany, where they studied and documented Native American artifacts in the collections of eight museums.

The office also coordinated the awarding of \$500 grants to twenty-six minority museum professionals. The awards supported the recipients' attendance at office-organized workshops and allowed the professionals to spend an additional week in residence at the Institution.

With the Toledo Museum of Art, the Kellogg Project—the office's special program to expand the educational role of museums—cosponsored a workshop on interpretive labeling for art museums. Two-member teams from ten museums attended. In 1987, the project broadened its Museum Professionals Program, making all senior-level employees eligible for ten-day residencies at the Smithsonian. Nearing completion at the end of 1987 was the book *Museums and Adult Education*, which will be published jointly by the Kellogg Project and the National University Continuing Education Association. Under the direction of coordinator Philip Spiess, the project's staff also produced *Museum and Community*, a soon-to-be-released film that focuses on four museums that have developed outstanding public education programs.

The Museum Reference Center, a branch of the Smithsonian Institution Libraries, responded to more than five thousand inquiries in 1987. The center also published several new bibliographies: *Children in Museums*, *Gifted Children in Museum Programs*, *Marketing of Museums*, and *Disaster Planning*. In addition, chief librarian Catherine Scott and her staff revised twelve bibliographies and resource guides in the center's series, which by the end of the year contained seventy-six publications.

Office of the Registrar

The Office of the Registrar is responsible for overseeing management of the Institution's vast collections. It plays a central role in developing the Smithsonian Collections Information System (CIS), and it works closely with individual bureaus to improve the care of their holdings. Through the Office of Museum Programs and the Registrar's Council, the Office of the Registrar provides training opportunities.

Through the Registrar's Council, Smithsonian personnel interested in collections management stay abreast of new developments and address issues of mutual concern. At the council's monthly informational meetings, which are held at various sites within the Institution, presentations are given by Smithsonian staff members and outside experts, such as insurance and customs brokers and automation and planning specialists.

At the initiative of the Registrar's Committee, a separate body was formed in 1987 to assess the need for creating security copies of records for all of the Institution's collections. The Records Preservation Committee will begin its task in 1988 with a thorough analysis of the accession records of the National Museum of American History. The analysis will evaluate various duplicating alternatives—such as microfiche and magnetic media. Factors to be considered in the evaluation, which will be conducted with the aid of an outside analyst, are storage methods, accessibility, and volume of use.

In June, the office's formal review of its operations and programs was presented to the Smithsonian Institution Management Committee. As stated to the Management Committee, the goals of the Office of the Registrar are to ensure efficient, timely access to accurate, complete information on the national collections; to ensure appropriate physical care of the national collections, which include objects, specimens, documents, and data; to lead, train, and motivate Smithsonian registration and collection-management personnel; and to strengthen management philosophy and quality of collection care at the Smithsonian and throughout the wider museum community. These goals address the four major aspects of collection work: intellectual collections, physical collections, personnel development, and service to the profession, respectively.

Also in 1987, the office initiated a program to survey museums worldwide for information on automation projects related to collections management. This program is being undertaken in cooperation with the Documentation Committee of the International Council of Museums.

Smithsonian Institution Traveling Exhibition Service

The Smithsonian Institution Traveling Exhibition Service (SITES) began 1987 by relocating its offices from the Arts and Industries Building to the new museum complex, and it ended the year with the inaugural exhibition in the adjacent International Gallery.

"Generations," the inaugural exhibition, presented the ties that bind not only parent and child, but also all the peoples of our planet, who, despite cultural differences, share similar hopes for coming generations. Tapping the Institution's vast collections and scholarly resources, the exhibition was supported with funding provided by the Smithsonian Special Exhibition Fund, the Smithsonian's International Center, and SITES. An extensive program of films, symposia, and family events is planned through the exhibition's six-month showing, and a companion book, *Generations: A Universal Family Album*, was published by SITES and Pantheon Books.

"Russia, The Land, The People: Russian Painting, 1850–1910," an exhibition featuring paintings from the collections of the State Tretyakov Gallery in Moscow and the State Russian Museum in Leningrad, opened at the Renwick Gallery in October 1986. The show marked the first exhibition exchange with the Soviet Union since the signing of a cultural agreement in November 1985. Shown also at the Smart Gallery of the University of Chicago, Harvard University's Fogg Art Museum, and the Los Angeles County Museum of Art, the exhibition drew 250,000 visitors during its ten-month tour. The SITES exchange exhibition, "New Horizons: American Painting, 1840–1910," will open in Moscow in November 1987.

About a third of the eighteen new exhibitions produced by SITES in 1987 were cooperative efforts involving other Smithsonian bureaus. These included "Fields of Grass" and "Magnificent Voyagers: The U.S. Exploring Expedition," with the National Museum of Natural History; "Rhythm and Blues," with the National Museum of American History; and "Vietnam Veterans Memorial: A National Experience," with the Office of Printing and Photographic Services. "Generations" was the product of collaboration with many Institution offices. In addition, the development of "Diversity Endangered," a new poster exhibition published with support from the National Science Foundation, benefited from the expertise of a committee of curators from several bureaus.

SITES continued to collaborate with other museums in developing new exhibitions. Among these exhibitions were "Savory Suppers and Fashionable Feasts: Victorian Dining in America" (Strong Museum, Rochester, New York); "Impressions of a New Civilization: The Lincoln Kirstein Collection" (Metropolitan Museum of Art, New



The Monument to Peter I on Senate Square in Petersburg, 1870, by V. I. Surikov, was one of sixty-four paintings lent by the State Russian Museum and the State Tretyakov Gallery for SITES' exhibition "Russia, the Land, the People: Russian Painting, 1850–1910."

York City); "Diamonds Are Forever: Artists and Writers on Baseball" (New York State Museum, Albany); "Hooray for Yiddish Theater in America!" (B'nai B'rith Klutznick Museum, Washington, D.C.); "Daughters of the Desert: Women Anthropologists and the Native American Southwest, 1880–1980" (New Mexico State University Museum, Las Cruces); and "Dutch Paintings of the Golden Age" (National Gallery of Ireland).

Two SITES exhibitions had international bookings during the past year. "Kings, Heroes, and Lovers" toured six Canadian museums, as well as one in Puerto Rico. "People of the Forest" was presented at a museum in Rotterdam, The Netherlands.

SITES received a significant grant from the MacArthur Foundation—the largest ever awarded to the Smithsonian for an exhibition. The grant is supporting development of "Tropical Rain Forests: A Disappearing Treasure" and of educational programs for the major exhibition, which will open in the International Gallery in May 1988. Also scheduled to open next spring is "King Herod's Dream: Caesarea on the Sea." SITES is organizing this exhibition in cooperation with the University of Maryland Center for Mediterranean Archaeology, the Caesarea Ancient Harbor Excavation Project, the Joint Expedition to Caesarea Maritima, and Israel's Department of Antiquities and Museums.

Eileen Rose, associate director for programs, was named acting director of SITES, replacing Director Peggy A. Loar, who resigned in July 1987 to head the Wolfsonian Foundation in Miami.

Exhibition Summary

SITES exhibitions during fiscal year 1987 are listed below.

- "Child to Child: American-Soviet Children's Art"
- "Daughters of the Desert: Women Anthropologists and the Native American Southwest, 1880-1980"
- "Diamonds are Forever: Artists and Writers on Baseball"
- "Diversity Endangered"
- "Dutch Paintings of the Golden Age"
- "Fields of Grass"
- "Generations"
- "Haiti: The First Black Republic and Its Monuments to Freedom"
- "Hooray for Yiddish Art in America!"
- "Impressions of a New Civilization: The Lincoln Kirstein Collection"
- "Italy: One Hundred Years of Photography"
- "Magnificent Voyagers: The U.S. Exploring Expedition"
- "Polished Perfection: The Art of Turned Wood Bowls"
- "Remaking America: New Uses, Old Places"
- "Rhythm and Blues"
- "Russia, The Land, The People: Russian Painting, 1850-1910"
- "Savory Suppers and Fashionable Feasts: Victorian Dining in America"
- "Vietnam Veterans Memorial: A National Experience"

Summary of SITES Exhibition Tours in Fiscal Year 1987

Number of bookings	396
Number of states served ^a	46
Estimated audience	10,000,000
Exhibitions listed in last <i>Update</i> ^b	122
New exhibitions produced	18

^aIncludes Washington, D.C.

^bCatalogue of SITES exhibitions.

PUBLIC SERVICE

Ralph C. Rinzler, Assistant Secretary for Public Service

National Demonstration Laboratory for Interactive Educational Technologies

The National Demonstration Laboratory for Interactive Educational Technologies (NDL) was established in February 1987 to help realize the full potential of one of the most powerful teaching tools of the Information Age.

The first U.S. facility to focus entirely on research and demonstration of interactive video technology, NDL is a joint project of the Smithsonian and the Interactive Video Consortium, a group of public television stations.

Through computer control of a recordlike disc "read" by a laser beam, large amounts of audio, video, and textual information can be manipulated in ways limited, essentially, only by the imagination of the user. Beyond educational applications, the technology presents new opportunities for organizing, storing, retrieving, and archiving information. In addition to the Smithsonian, other museums, and public broadcasting stations, the technology's potential beneficiaries include schools—elementary through college—government agencies, and the home user.

The NDL features an extensive array of hardware—nearly all of it on extended loan from manufacturers—and software, donated by the industry. Contributions from industry also provide principal support for the laboratory's activities. NDL visitors, who numbered more than five hundred during the first three months after the laboratory's opening, can evaluate this large collection of interactive equipment and software in a noncommercial atmosphere.

Projects

The NDL quickly established itself as a resource for Smithsonian offices and bureaus. It advised staff of the Visitor Information and Associates' Reception Center on planning a videodisc-based orientation system for the Smithsonian Information Center, scheduled to open in 1989. The NDL made contacts with IBM, which also has provided considerable assistance in designing and developing the videosystem.

Again acting as a technical adviser and intermediary, the laboratory consulted with staff members of the University of the Air project, which is developing a twenty-six-hour public television series, as well as videotapes and videodiscs, on the intellectual and cultural history of the twentieth century. The NDL also arranged a meeting of prospective underwriters for the project and solicited technical assistance from outside experts affiliated with the laboratory.

In 1987, American Interactive Media, one of several



Nancy Barbour of APCO Associates enthusiastically describes interactive technologies to a guest at the opening reception for the National Demonstration Laboratory.

firms associated with the laboratory, agreed to fund the planning and design of an interactive compact disc version of *Treasures of the Smithsonian*, a book published by the Smithsonian Institution Press. The company and Smithsonian representatives are exploring other applications of the technology.

As part of its efforts to introduce the many and varied units of the Institution to the new educational technology, the NDL arranged for several Smithsonian staff members to attend a ten-day IBM training course on interactive videodisc planning, design, and production. The computer firm provided free registration. Also through NDL, Apple is donating ten advanced workstations to the Smithsonian. The workstations will allow selected researchers and curators to experiment with multimedia computer programming. With the Smithsonian Institution Press, the NDL organized a group of Smithsonian staff members involved in publishing and production to examine the requirements and opportunities for tandem production of printed works and interactive videodisc programs.

National Science Resources Center

Concern over the state of science and mathematics education in the nation's elementary and secondary schools led to the establishment in 1985 of the National Science Resources Center (NSRC). A joint undertaking of the Smithsonian and the National Academy of Sciences, the NSRC's mission is to improve the teaching of precollege science and mathematics by establishing a science and mathematics curriculum resource center and information data base, developing resource materials for teachers, and offering a program of leadership-development activities.

Initial Projects

A primary aim of the NSRC is to identify, develop, test, and disseminate scientifically up-to-date teaching materials that stimulate student interest. Building on the lessons learned from past efforts to improve science curricula and on the experiences of school systems with exemplary science programs, the center is concentrating initially on the improvement of science teaching in elementary schools. The goal of the NSRC's first major project, "Science and Technology for Children," is to make young children aware of the power of science in helping them solve problems and understand their surroundings. During the next four years, project staff, collaborating with research scientists, teachers, and science-curriculum experts will design a set of hands-on units for grades one through six—simple scientific investigations intended to develop children's problem-solving and critical-thinking skills and to broaden their understanding of important concepts. Design, field testing, and dissemination of the units will be accomplished in cooperation with a growing network of school systems, state departments of education, science museums, and research scientists. The development of this network began with the NSRC's National Conference on the Teaching of Science in Elementary Schools, which was held in 1986.

In July 1987, the center sponsored a four-week materials-development workshop, held in the Learning Center of the National Museum of Natural History. Representing a broad range of school districts, including two Native American communities, more than seventy scientists, teachers, science-curriculum specialists, and science-museum educators participated. The combined efforts of the participants resulted in promising teaching activities in such areas as microbiology, electrical circuits, the chemistry of liquids, plant growth, and insects. During the 1987-88 school year, the staff of the Science and Technology for Children Project will develop these activities

further and organize them into the first set of teaching units. Elementary school teachers in urban, rural, and suburban school systems will field-test the units, which will then be revised, published, and distributed to school systems throughout the country.



Fifth-grade students investigate the microscopic world of one-celled organisms as part of the National Science Resources Center's Science and Technology for Children Project. (Photograph by M. D. Bird)

Office of the Committee for A Wider Audience

Established in 1986, the Office of the Committee for a Wider Audience (OCWA) seeks to extend the reach of the Smithsonian's programs to segments of the public that traditionally have been underrepresented at these activities. The office evolved from the recommendations of an ongoing committee of fourteen Smithsonian managers and community representatives, formed in 1983 to help the Institution's bureaus and offices devise measures that ensure participation of more diversified audiences.

In 1987, the office continued to support the work of the Committee for a Wider Audience, and it added new functions aimed at expanding the Smithsonian's outreach programs. These duties are carried out in conjunction with other units of the Institution. With the Office of the Assistant Secretary for Public Service, for example, the OCWA coordinates the meetings and programs of the Smithsonian Cultural Education Committee, a public advisory group to the Institution's senior-level management. Across the Smithsonian, the OCWA advises bureaus and offices on their programs to recruit minority professionals. It also assists in efforts to attract members of underrepresented ethnic groups to serve as volunteers and to join the Institution's local and national membership organizations. The OCWA provides additional support by building and sustaining relationships with minority communities.

Exposure to the Smithsonian is an essential ingredient of measures to attract new audiences. The OCWA attempts to ensure participation of minority groups at receptions and other special events, such as the opening of the new museum complex in 1987. In addition, it organized a reception to mark the creation of the Cultural Education Committee and to commemorate the birthday of Dr. Martin Luther King, Jr. On a broader scale, the OCWA, the Office of Public Affairs, and *Smithsonian* magazine developed and launched a nationwide public awareness campaign. Television and radio public service announcements and advertisements on local buses and subways are designed to acquaint minorities with the Institution's ethnic programs and services. Ads and articles written for publications that serve black audiences also are planned. Also, the committee, working with the Resident Associate Program, organized the "Brazilian Showcase," which was part of the Washington, D.C., International Filmfest.

In collaboration with the education staffs of the National Museum of African Art, Sackler Gallery, and International Center, the OCWA organized a series of "open houses" to introduce students from Washington, D.C., public schools to the new museums. The visits



James Brown, a docent at the National Museum of African Art, discusses with sixth-grade students a Dandai mask in the "African Art in the Cycle of Life" exhibition. (Harrison Eiteljorg Collection. Photograph by Jeffrey Ploskonka)

were designed to complement classroom instruction on world cultures and on the Eastern Hemisphere.

Finally, the office and the Program in Black American Culture at the National Museum of American History sponsored a conference of scholars and museum professionals, who examined museum programs that have successfully integrated the cultures and histories of ethnic groups generally neglected by traditional museums.

Office of Elementary and Secondary Education

The Office of Elementary and Secondary Education (OESE) works with other Smithsonian education offices to help schools reap the full instructional value of museums. To achieve the potential of museum objects as educational resources, the OESE offers a variety of publications and local and national programs.

An important aim of the office's symposia and courses for teachers is to demonstrate how to teach by using a museum-oriented approach. During 1987, the office collaborated with education departments around the Mall to organize eleven courses for teachers from the Washington, D.C., area and one graduate-level course for instructors from around the country. In addition, the OESE's Regional Workshop Program conducted three day-long sessions in Jackson, Michigan; Waterloo, Iowa; and Philadelphia, Pennsylvania. Concomitantly, the OESE Teacher Internship Program built on the work of the Regional Workshop Program by training high school teachers to serve as liaisons between their local museums and schools.

The office also organizes special programs that focus on important events and issues. In 1987, the OESE sponsored the symposium "Teaching the Constitution," which attracted 150 elementary and secondary school teachers and administrators from throughout the mid-Atlantic region. Presentations focused on social issues in the context of the Constitution, while workshops addressed matters related to classroom instruction on the nation's founding document. Also in conjunction with the Bicentennial of the Constitution, the September issue of *Art to Zoo*, the office's quarterly publication with a national circulation of seventy thousand, was devoted to teaching the concept of individual rights and responsibilities of citizenship.

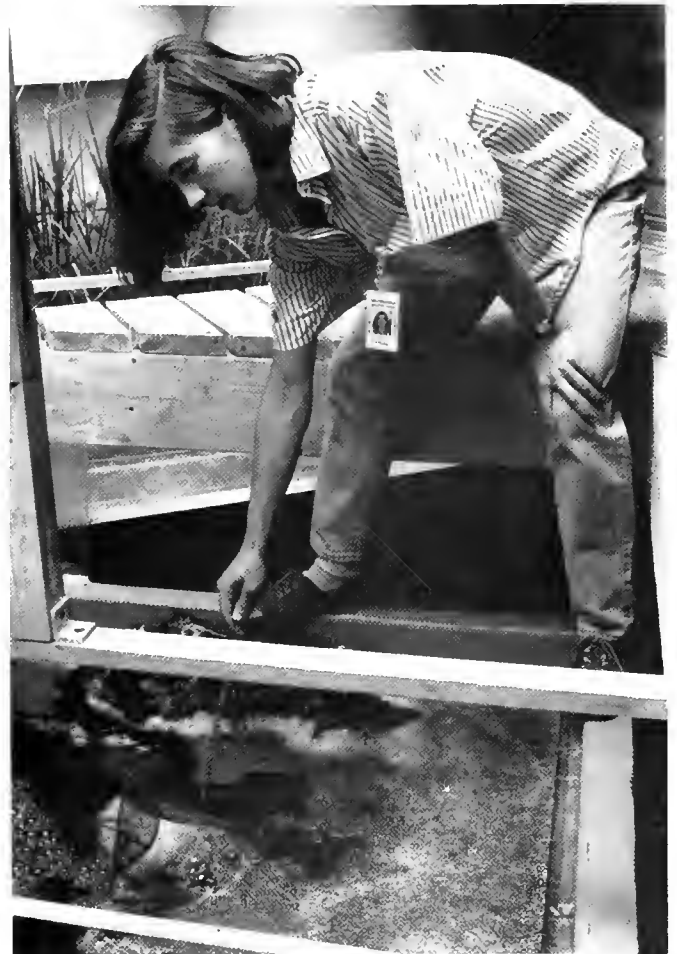
The OESE also continued to publish *Let's Go to the Smithsonian*, a newsletter distributed to about twelve thousand teachers in and around Washington, D.C. The periodical alerts teachers to events at the Smithsonian.

In collaboration with the Smithsonian Institution Press and the Office of Telecommunications, the OESE's Special Education Program published a manual and videotape designed to help museum docents work more effectively with disabled visitors. The materials will be used at the Institution and at museums throughout the country.

On July 10, the office convened the first meeting of the Smithsonian Advisory Council on Education. Appointed by Secretary Adams, the council is charged with helping the Institution establish its priorities in museum-based educational activities and in outreach programs.

Through teacher training programs, publications, spe-

cial education programs, and precollege training for young people, OESE continues to help teachers and students effectively use museums as educational resources.



One of forty interns in the Office of Elementary and Secondary Education's High School Intern Program, Susan Van Gundy works in the National Museum of Natural History's Coral Reef exhibition. (Photograph by Christopher Haze)

Office of Folklife Programs

Folklife refers to the traditional social processes, cultural patterns, and material products of tribal, familial, ethnic, regional, and occupational groups. Folklife embodies the creative strength of a diverse humanity. It is the accumulated traditional wisdom and aesthetics of uncounted cultural groups throughout the world, and it is the way in which people establish continuity with the past. Today, the integrity and continuity of the folklife traditions of many communities are endangered. The Office of Folklife Programs engages in cultural conservation activities—scholarly research, professional advocacy, and public programs—that encourage continuity, integrity, and equity for traditional cultures in the United States and abroad.

Festival of American Folklife

For two weeks each summer since 1967, the Mall becomes a “museum without walls,” a venue for presenting living cultural exhibitions on American and international folk traditions. The festival provides needed national visibility for traditional cultures and exposes the general public to the skills, knowledge, and aesthetic expressions of diverse peoples. Cosponsored by the National Park Service, the twenty-first annual festival (June 24–28, and July 1–5) featured Michigan folklife, a program on the nation’s multilingual heritage, music of the cultural communities of the Washington, D.C., area, and evening dance parties.

In celebration of Michigan’s 150th anniversary as a state, craftspeople, musicians, fishermen, cooks, and auto workers demonstrated the state’s regional, ethnic, and occupational traditions. The program highlighted the role of natural resources—especially waterways—and the importance of migration in shaping the cultural expressions of Michigan’s population.

“Cultural Conservation and Languages: America’s Many Voices” featured songs, music, crafts, oratory, and ceremonies, as presented by participants from Chinese-, Lao-, Mexican-, and Anglo-American communities from around the nation. The presentations illustrated the important roles languages play in preserving cultural heritage.

In the first in a continuing series of annual programs, musicians from the varied communities of metropolitan Washington, D.C., introduced thousands of festival visitors to the musical traditions of their native cultures. The musicians represented the area’s African, Afro-American, Anglo-American, Asian, Carribean, and Latin American communities.

Folkways Archives

When the Institution acquired Folkways Records, the best-known commercial publisher of folk and tribal music in the United States, it also became custodian of an extensive collection of unreleased material—field tapes and ethnographic documentation—that is likely to be of great value to researchers. The Folkways Archives includes books, audiotapes, original glass disks, field reports, historical correspondence, and art works. In 1987, staff members began developing systems for storing, accessioning, and cataloguing the archives. In concert with other bureaus and outside organizations, the office also began defining policies for managing the collection and for continuing production of Folkways Records.

With the Smithsonian Institution Press, the office will have ultimate responsibility for Folkways Records. Policies governing continued record production also are being developed in concert with other bureaus and outside experts.

Research

Work on monographs and accompanying films in the Smithsonian Folklife Studies series continued in 1987. Established in 1978, this innovative series uses book-length monographs and complementary ethnographic films to document and analyze particular traditions to a level of detail unachievable when either medium is used alone. The monograph *The Korean Onggi Potter* by Robert Sayers, Department of Anthropology, California Academy of Sciences, with Ralph Rinzler, assistant secretary for public service, was published during the past year.

Also in 1987, the office initiated studies of Massachusetts folklife, and it began formulating plans for research on the family farm, Native American and Afro-American traditions, and the cultural traditions of Southeast Asian immigrants. International undertakings included planning for collaborative studies in Latin America, China, Pakistan, Indonesia, the Soviet Union, and the Arab Gulf States.

Special Projects

The Office of Folklife Programs began planning for symposia, exhibitions, and other programs that will commemorate the Columbus Quincentenary in 1992. With Radio Smithsonian, the office produced a pilot program



Los Matachines de Ladrillero, sacred processional dancers from Laredo, Texas, perform the ritual dance that venerates the legend of Santa Cruz, the Holy Cross, at the Festival of American Folklife.

on international music, which could develop into a weekly broadcast. During the past year, Radio Smithsonian featured music recorded at the 1986 Festival of American Folklife and, in collaboration with the office, developed programs on the cultural consequences of migration and on the role of language in preserving traditional cultures.

In cooperation with the Smithsonian Institution Traveling Exhibition Service, the office curated the exhibition "The Grand Generation: Memory, Mastery, Legacy," which documents the role that older people play in preserving and passing down traditional culture from generation to generation. The exhibition opened in November 1987 in Fort Lauderdale, Florida, and will tour for two years.

Office of Interdisciplinary Studies

The Office of Smithsonian Symposia and Seminars changed its name in December 1986 to communicate more clearly its mission: exploring gaps in knowledge and delivering new results of scholarship in the humanities and the physical, natural, and human sciences. The office seeks to strengthen integrative learning inside and outside the Institution. Its programs gather practitioners, patrons, and users of research, as well as interested members of the general public. These activities demonstrate that increasing and diffusing knowledge—the terms of the Smithsonian's mandate—are interdependent parts of the same process.

Appropriately, the Smithsonian's ninth International Symposium focused on the Constitution. Held May 18–23, in Charlottesville, Virginia, and Washington, D.C., "Constitutional Roots, Rights, and Responsibilities" was the scholarly centerpiece of the nation's observance of the Bicentennial of the Constitution. Representing twelve countries, the sixty-eight symposium participants included Lord Hailsham, Lord High Chancellor of Great Britain, and Robert Badinter, president of the Conseil Constitutionnel de France. Among the participants from the United States were Warren E. Burger, former Chief Justice of the United States; Supreme Court Justice William J. Brennan, Jr.; Judith Shklar, Harvard University professor of government; Cornell University historian Michael Kammen; Derrick A. Bell, Jr., Harvard University professor of law; psychiatrist and educator Robert Coles; consumer advocate Ralph Nader; Joyce Oldham Appleby, University of California at Los Angeles historian; and Ernest L. Boyer, president of the Carnegie Foundation for the Advancement of Teaching.

Thought-provoking discussions punctuated the proceedings, which attracted students and others from around the country. Parts of the symposium were broadcast by C-Span, Voice of America, and Worldnet. Essays based on the event will be published in a forthcoming volume, edited by the symposium chairman, A. E. Dick Howard, University of Virginia. In addition, the office is producing "Rights at Risk: The Responsibilities of Citizenship," a half-hour video documentary for high school students.

Also as part of the bicentennial commemoration, the office is organizing "Afro-Americans and the Evolution of a Living Constitution," scheduled for March 1988. Organized with the Joint Center for Political Studies, the symposium will examine how the struggles of black Americans for full citizenship have influenced constitutional law and how they have affected other domestic groups.



An academic procession from the National Museum of American History to the Departmental Auditorium opened the ninth international Smithsonian symposium in Washington. Led by pipers, General Counsel Peter Powers served as marshal, and Regent Jeannine Smith Clark carried the Smithsonian mace.

To mark the opening of the Arthur M. Sackler Gallery, the office organized "Recreations with the Muses," a symposium on creativity in the arts and sciences. At the all-day event, held September 11 at the National Academy of Sciences, accomplished individuals in a variety of fields described the underlying elements and processes to which they attributed their moments of inspiration.

At the close of the year, the office completed preparations for "Science, Ethics, and Food," an international colloquium devoted to global food issues. M. S. Swaminathan, architect of India's "green revolution," was scheduled to receive the first General Foods World Food Prize at the meeting, slated for October 6–7, 1987.

The office continued to develop a series of intramural seminars intended to foster a greater sense of intellectual community among Smithsonian staff members and fellows and to bridge institutional boundaries that may hamper fruitful collaborations in related areas of interest. The first of the "Ways of Knowing" seminars was scheduled for fall 1987.

Office of Public Affairs

The public learns about much of the Smithsonian's research, exhibitions, permanent collections, and programs through accounts appearing in newspapers and magazines and airing on television and radio. In their efforts to portray the Smithsonian, the news media request the assistance of the Office of Public Affairs, which provides news releases, backgrounders, publications, photographs, videotapes, and logistical support. The office also oversees Institution-wide information and advertising programs.

The office coordinated the massive publicity program for the opening of the Smithsonian's new museum, research, and education complex on September 28. This program involved working with hundreds of media outlets in the United States and abroad. The office produced press kits and photographs, radio and television public service announcements, a special supplement of the employee newspaper, advertisements in national newspapers and magazines, and an exhibition for the Martin Luther King, Jr., Library in Washington, D.C.

A press preview in September attracted the largest single-day press draw in the Institution's history. Nearly three hundred people attended the all-day event, representing ninety-eight different print-media organizations and nineteen broadcast outlets. In-depth coverage of the Sackler Gallery, National Museum of African Art, and International Gallery appeared in major national news media, including the *Washington Post*, *New York Times*, *Associated Press*, *UPI*, *Reuters*, *Wall Street Journal*, *Christian Science Monitor*, *Chicago Tribune*, *Miami Herald*, and *Philadelphia Inquirer*, as well as overseas publications. The museums were covered by national and international television and radio.

During the year, the Office of Public Affairs updated and revised its visitor brochures, including the popular "Welcome" brochure distributed at all visitor information desks. The brochure was prepared in French, Spanish, German, Japanese, and, for the first time, Chinese and Arabic. The office also published a revised edition of "A Guide for Disabled Visitors," as well as a flyer and commemorative brochure about the new museum complex.

As part of its ongoing commitment to reach an ever-wider audience, the office expanded its Hispanic Outreach Program. During the year, the office increased its contact with the Hispanic media and began distributing a monthly calendar of events in Spanish. The Hispanic edition of the Smithsonian News Service, supported by a grant from the Educational Outreach Program, continued to be popular with more than one hundred Hispanic publications. A briefing for Hispanic media on the Columbus Quincentenary attracted twenty-nine journalists.



A press preview of the Smithsonian's new museum complex attracted the largest single-day press draw in the Institution's history as 300 journalists came to hear Secretary Robert McC. Adams and other officials and to view the Arthur M. Sackler Gallery, the National Museum of African Art, and the International Gallery. (Photograph by Dane Penland)

Accomplishments in the office's Black Outreach Media Program included preparation of backlit posters for display in Metro subway stations, advertisements for Black History Month, and radio public service announcements. The office also updated "Explore Your Heritage," a brochure highlighting Smithsonian programs of interest.

The office issued more than five hundred news releases on Smithsonian activities and also provided publicity assistance to other bureaus and offices in the Institution. It planned and implemented major publicity campaigns for the acquisition of Folkways Records, the reopening of the Anacostia Museum, the formation of the National Demonstration Laboratory for Interactive Educational Technologies and the National Science Resources Center, the groundbreaking of the Tupper Research and Conference Center in Panama, the opening of the Enid A. Haupt Garden, and the Ninth International Symposium on Constitutional Roots, Rights, and Responsibilities. The office organized a media luncheon to introduce the Smithsonian's Cultural Education Committee, which is aimed at helping to increase wider audience visitation.

The office's publications, including its three-times-a-year periodical *Research Reports*, were recognized for excellence by the Society for Technical Communications. *The Torch*, a monthly newspaper for the Smithsonian staff, received honors from the National Association of Government Communicators, and Smithsonian News Service stories received awards from both organizations.

Office of Telecommunications

In collaboration with the Institution's scientists and historians, the Office of Telecommunications produces films, radio shows, and television programs that present the fruits of the Smithsonian's wide-ranging activities to the American public. Winners of numerous awards, the office's productions have introduced many Americans to their national museums.

In December 1986, Nazaret Cherkezian retired after serving twelve years as director of the Office of Telecommunications. Associate director Paul Johnson was named acting director, and a smooth transition enabled staff members to move forward on a wide range of projects.

During the past year, the Smithsonian Television, Film, and Radio Communications Council was established to develop strategies and priorities for future initiatives in electronic media. The office is working closely with the council to lay specific plans for its operation and for media projects that convey the full range of research and scholarship in the Institution's bureaus.

The office continued to produce two major program series that highlight research, exhibitions, and performances at the Institution. "Here at the Smithsonian," a series of short television features, launched its sixth season, airing on 180 subscribing stations that serve more than half of the prime-time viewing audience in the United States. "Radio Smithsonian," a weekly, thirty-minute series, reaches a potential audience of three million people. In 1987, the office began exploring the possibility of producing a weekly, one-hour radio show for nationwide distribution. Featuring a much wider sampling of the Institution's music and performance programs, the show would succeed "Radio Smithsonian." Production of a pilot show, in cooperation with public radio station WETA-FM, could begin in early 1988.

Thirteen film and video projects were completed by the office in 1987. *From Reliable Sources*, a film produced at the request of the Archives of American Art, chronicles the unique role of the archives in documenting the history of American art. *Disabled Museum Visitors: Part of Your General Public*, a training tape for docents, was produced in cooperation with the Office of Elementary and Secondary Education. The video *Diversity Endangered* complements a poster-panel exhibition, produced by the Smithsonian Institution Traveling Exhibition Service. The video and exhibition examine how human activities are jeopardizing biological diversity in tropical forests. *Field to Factory*, produced in conjunction with the National Museum of American History (NMAH) exhibition of the same name, details the migration of blacks from the rural South to urban North between 1915 and

1940. Also for NMAH, the office produced a video epilogue to the exhibition "Engines of Change," which explores the nation's transformation into an industrial power.

Projects nearing completion at the end of 1987 included *Magnificent Voyagers*, a half-hour film on the U.S. Exploring Expedition of 1838-1842. The film is being produced for the National Museum of Natural History's Office of Education. Another nearly completed film, *Building a Biosphere*, focuses on the effort of the Smithsonian's Marine Systems Laboratory to create models of the Chesapeake Bay and Florida Everglades ecosystems.

For the Visitor Information and Associates' Reception Center, the office began work on a comprehensive videotape that will be used at the new information center being built in the Castle. The office also will help produce interactive video programs that will allow visitors to summon specific information about the museums.

The office continued to develop quality video and audio programming for children and to explore new educational opportunities for young audiences. The pilot for "Smithsonian Quest," a planned television series for children between the ages of nine and twelve, was well received by education specialists, and the office began seeking an appropriate coproducer. The office also began initial research to develop a potential series of audio cassettes for classroom use in the fifth and sixth grades.

The Smithsonian Institution Press each year produces more than one hundred books, monographs, and recordings relating to the Institution's collections and research interests. In 1987, the Press continued on a path of steady growth and increased productivity, and initiated important changes that promise additional enhancements in performance and service. For example, the Press developed several new series—from reprints of "Old West" classics to new titles on American cultural history—and quadrupled its sales force. The Press also reorganized its fulfillment service for University Press books, and continued to build the staff of acquisitions editors. At the same time, the Press expanded activities on the international publishing scene, in both marketing and editorial matters, and furthered efforts to develop a continuity series in the Direct Mail Division. Publishing projects tailored to juvenile and general markets continued to progress. Several of these developments are discussed in more detail below.

University Press Division

In the University Press Division, the federally funded *Contributions* and *Studies* Series program neared its goal of complete electronic processing of all manuscripts. With all the components of the desktop publishing system in place, program staff members edited and typeset all manuscripts on computer. This development eliminated all charges to bureau sponsors for typesetting and page makeup. Estimated savings to the Institution during the past year covered the cost of the equipment for the electronic system. Moreover, Series editors now have greater control over production details and offer authors greater typographic flexibility than was previously possible.

Some of the new *Contributions* and *Studies* titles published in 1987 were "The Allende Meteorite Reference Sample," by Eugene Jarosewich, et al. (*Smithsonian Contributions to the Earth Sciences*, no. 26); "A History and Annotated Account of the Benthic Marine Algae of Taiwan," by Jane E. Lewis and James N. Norris (*Smithsonian Contributions to the Marine Sciences*, no. 29); "Biology of Freshwater Fishes of the Bermuda Ocean Acre," by Robert H. Gibbs, Jr., and William H. Krueger (*Smithsonian Contributions to Zoology*, no. 452); "The Korean Onggi Potter," by Robert Sayers with Ralph Rinzler (*Smithsonian Folklife Studies*, no. 5); and "A Brief History of Geomagnetism and a Catalog of the Collections of the National Museum of American History," by

Robert F. Multhaupt and Gregory Good (*Smithsonian Studies in History and Technology*, no. 48).

New titles published by the University Press Division spanned a broad range of subjects. The lead title on the 1987 spring list was *The Music Men: An Illustrated History of Brass Bands in America, 1800–1920*, by Margaret Hindle Hazen and Robert M. Hazen. Announced at the American Booksellers Association Convention in May, the book has received laudatory reviews. Fred Starr, president of Oberlin College, said: "This glorious volume evokes the last era before what Sousa dubbed 'canned music'; and it does so with scholarly diligence, sympathy, thoroughness, and imagination. A charming book."

The division also inaugurated the new Smithsonian Series in Archaeological Inquiry with the publication of *The Archaeology of Western Iran*, edited by Frank Hole. The Smithsonian Series in Ethnography, which debuted in 1986, issued *The Passion of Ansel Bourne: Multiple Personality in American Culture*, by Michael Kenny, and *Pilgrims of the Andes*, by Michael Sallnow. Two new volumes on twentieth-century art were produced in cooperation with the National Museum of American Art: *Modern American Realism: The Sara Roby Foundation Collection*, by Virginia M. Mecklenburg, and *Gene Davis: A Memorial Exhibition*, by Jacquelyn D. Serwer. New books on aviation history included *Rebels and Reformers*, by R. E. G. Davies, and *Another Icarus: Percy Pilcher and the Quest for Flight*, by Philip Jarrett. Among the Press's new titles in the sciences were *Mercury: The Elusive Planet*, by Robert G. Strom, and *The Tanagers: Natural History, Distribution, and Identification*, by Morton and Phyllis Isler. *Animal Intelligence: Insights into the Animal Mind*, edited by R. J. Hoage and Larry Goldman, was issued in the National Zoological Park Symposia for the Public Series.

Service to Other Bureaus

The September 28 opening of the new museum complex was preceded by a crush of publishing activity. For the Arthur M. Sackler Gallery and National Museum of African Art, the Press handled production and distribution of four catalogues: *Asian Art in the Arthur M. Sackler Gallery: The Inaugural Gift*; *African Art in the Cycle of Life*; *Royal Bemm Art: Selections from the National Museum of African Art*; and *Patterns of Life: West African Strip-Weaving Traditions*. The Press also handled production of invitations and announcements for the opening. In addition, the Press conceived, developed, and published A

New View from the Castle, written by Edwards Park, with Jean Paul Carlhian, chief design architect of the complex. The volume is an illustrated account of the complex's architecture and personae.

Recordings Division

The Recordings Division produced and released three new albums under its Smithsonian Collection label, each with extensive liner notes in an accompanying book. The largest of these was the updated, redesigned edition of the division's first release, *The Smithsonian Collection of Classic Jazz*, originally issued in 1973. Programmed and annotated by Martin Williams, the new edition features seven records or five cassettes. *Singers and Soloists of the Swing Bands*, programmed by Martin Williams and annotated by Mark Tucker, was released in August in six-record and four-cassette formats. The third release, *Jimmie Rodgers on Record: America's Blue Yodeler*—available as a set of two records or cassettes—featured a booklet by Nolan Porterfield, Rodgers's biographer. The Folklife Center of the Library of Congress included the release in its 1987 *Selected List* of new recordings. Honors also were accorded to the booklet accompanying last year's release *Virtuosi*. Written by music critics Richard Freed and Peter Eliot Stone, the booklet was nominated for a 1987 Grammy Award for Best Album Notes and received the ASCAP-Deems Taylor Award for distinguished writing on the subject of music.

Smithsonian Books

Published in 1987, *The Smithsonian Book of Flight*, by former National Air and Space Museum Director Walter J. Boyne, was distributed to the Smithsonian Associates by direct mail and to the retail book trade by Crown Publishers. In addition, the Book-of-the-Month Club offered the 256-page volume as a dividend selection. Containing more than three hundred illustrations and photographs, *The Smithsonian Book of Flight* has received uniformly good reviews, and sales have exceeded expectations.

Other Developments

To accommodate continued growth, the Press contracted with sixteen commissioned sales representatives, a four-

fold increase over the previous year. Sales representation in the United States is now on a par with the largest of the university presses. Overseas, sales representation remains the same: Eurospan in the United Kingdom and continental Europe; Scholarly Book Services in Canada; UBS in India; Feffer and Simons and also Maruzen Company, Ltd., in Japan; Cambridge University Press in Australia; and Feffer and Simons in the rest of the world. The Press has become increasingly active in foreign markets. In 1987, representatives journeyed to publishing organizations in the Far East and Western and Eastern Europe. The Press hosted a delegation representing China's university presses, a Chinese scientific publications group, and a delegation from Yugoslavia.

Awards and honors continue to enhance the status of the Press's lists and staff. Among the more noteworthy accolades in 1987 were the design award of the Art Directors Club of Washington to *Gene Davis: A Memorial Exhibition*; the Phi Beta Kappa Award in science to Fred L. Whipple's *The Mystery of Comets*; and the Book-of-the-Year Award of the Wildlife Society South-eastern Section for Paul B. Hamel's *Bachman's Warbler*.

Finally, for the eighth consecutive year, the Press's net gain resulted in a substantial contribution to the Institution's unrestricted general trust funds. The net gain for 1987 exceeded the Press budget by 117 percent.

Smithsonian Magazine

Smithsonian is the official magazine of the Institution. To many of its primary audience of four million and pass-along audience of an additional three million, it provides their only experience with the Institution. *Smithsonian* has the largest circulation of any museum-affiliated magazine in the world. The Institution's educational message is evident in the monthly magazine's regular coverage of every subject area of the Smithsonian museums: art, history, science, and technology.

Although it deals directly with the Institution every month through columns such as the Secretary's "Smithsonian horizons," Ted Park's "Around the Mall and beyond," and "Smithsonian highlights," the magazine is not a house organ in the usual sense—nor was it ever intended to be. Its mandate is not only to represent the *Smithsonian* explicitly, but also to examine subjects in which the Institution is interested.

Subscribers receive discounts on books and records from the Smithsonian Institution Press and on educational items available in the museum shops and through a catalogue produced by the Business Management Office. Subscribers are also eligible to participate in tours, regional events, and other activities sponsored by the National Associate Program.

The magazine provides a constant flow of new members to the Contributing Membership, the Resident Associate Program, and the Cooper-Hewitt Museum Associate Program. For these programs, the magazine is the principal benefit of membership.

During 1987, *Smithsonian* magazine presented a varied menu of stories about the sciences, the arts, and history. Beyond covering Smithsonian activities in regular columns, the magazine published articles on the John La Farge exhibition (National Museum of American Art), the "Field to Factory" exhibition (National Museum of American History), the dinosaur exhibition (National Museum of Natural History), the acquisition of Folkways Records, and the rhinoceros relocation project in Nepal (Smithsonian/Nepal Terai Ecology Project). To mark the openings of the Haupt Garden, the Sackler Gallery, and the Museum of African Art, the magazine ran one cover and twenty-six editorial pages, much of which was reproduced in a special reprint. In addition, three related stories paid particular attention to issues concerning tropical forests. One examined the conflict between the long-range benefits of forest conservation and the immediate needs of Central Americans who are trying to wrest a living from the land. The two other stories discussed ongoing Smithsonian research projects in Latin America. *Smithsonian* recognized

the Constitution's bicentennial with major stories on the Constitutional Convention and on James Madison.

In 1987, *Smithsonian* articles were widely reprinted in commercial publications and in educational and nonprofit journals. The magazine also received recognition from peers in the publishing world in the form of a special award for excellence from the American Society of Journalists and Authors.

Financially, the magazine experienced its best year. In keeping with the generally low inflation rate, costs were under control. While the number of advertising pages was down during the first half of the year, the number during the second half was up compared with the previous year. Circulation was stable at 2.3 million.

“Smithsonian World”

“Smithsonian World,” the prime-time public television series coproduced by the Institution and WETA, completed a highly successful third season. Since it began in January 1984, the series has aired seventeen one-hour specials, hosted by David McCullough, and it has quickly evolved into one of the most popular offerings of the Public Broadcasting Service.

In its third season, “Smithsonian World” featured five cultural documentaries that examined American institutions and the forces that have shaped them. The series, created under the leadership of executive producer Adrian Malone, was awarded a Primetime Emmy in the category of Outstanding Informational Series.

The season premiered in November 1986 with the airing of “The Wyeths: A Father and His Family,” and critics responded with high praise, citing the program, in the words of one, as a “compelling example of what television does best.” Geof Bartz was nominated for a News and Documentary Emmy in the category of Outstanding Individual Achievement for Film Editing. The four other specials that aired in 1987 were “Voices of Latin America” (April), “The Elephant on the Hill” (May), “The Promise of the Land” (June), and “Islam” (July). A special screening of “Voices” was held at the National Museum of American History, and the Egyptian Embassy hosted a screening of “Islam,” which was enthusiastically received in the Middle East.

In addition to the Primetime Emmy for 1987, “Smithsonian World” received the American Film Festival Red Ribbon, a CINE Golden Eagle award, and a Clarion award for excellence in communication.

Syndication and cassette rights for programs airing during the first and second seasons of “Smithsonian World” were sold to LBS Communications. The programs are being repackaged as one- and two-hour specials to be aired on local commercial stations.

Visitor Information and Associates’ Reception Center

The Visitor Information and Associates’ Reception Center (VIARC) is the Institution’s central point for providing information, assistance, and membership services to the public, Associate members, staff, volunteers, and interns. Offering many of its services seven days a week, the center coordinates and directs the efforts of large numbers of volunteers, who are an integral part of the Institution’s public information programs and its behind-the-scenes activities.

In 1987, the Institution completed a resoundingly successful private fund-raising campaign for the \$2.7 million Smithsonian Information Center, which will be located in the Smithsonian Institution Building. Major gifts were received from the PEW Memorial Trust, The Kresge Foundation, and the Morris and Gwendolyn Cafritz Foundation. The Smithsonian Contributing Membership, the National Board, and the James Smithson Society also made generous contributions.

VIARC’s proposed Institution-wide exterior graphic information system moved forward with the endorsement of the color scheme, logo, typography, and base material by the Commission of Fine Arts.

The Museum Information Desk Program was expanded to include services for the National Museum of African Art, Arthur M. Sackler Gallery, and the kiosk of the S. Dillon Ripley Center. Eighty volunteer information specialists underwent a special, comprehensive training program to provide services in the new museum complex. In addition, some 188 volunteers assisted the staff in preparing for the many special events preceding the public opening of the complex.

The center’s Telephone Information Program recorded some 406,000 inquiries during the year. Record traffic days included February 23, the date of one of the winter’s major snowstorms, when 1,263 telephone inquiries were received. Over the April 15 weekend, the date of the Washington Craft Show and the Paul E. Garber Facility Open House, more than two thousand calls were answered. During the summer, the hottest in years, the Mobile Information Service provided full out-of-doors information assistance, operating seven days a week from Memorial Day to Labor Day.

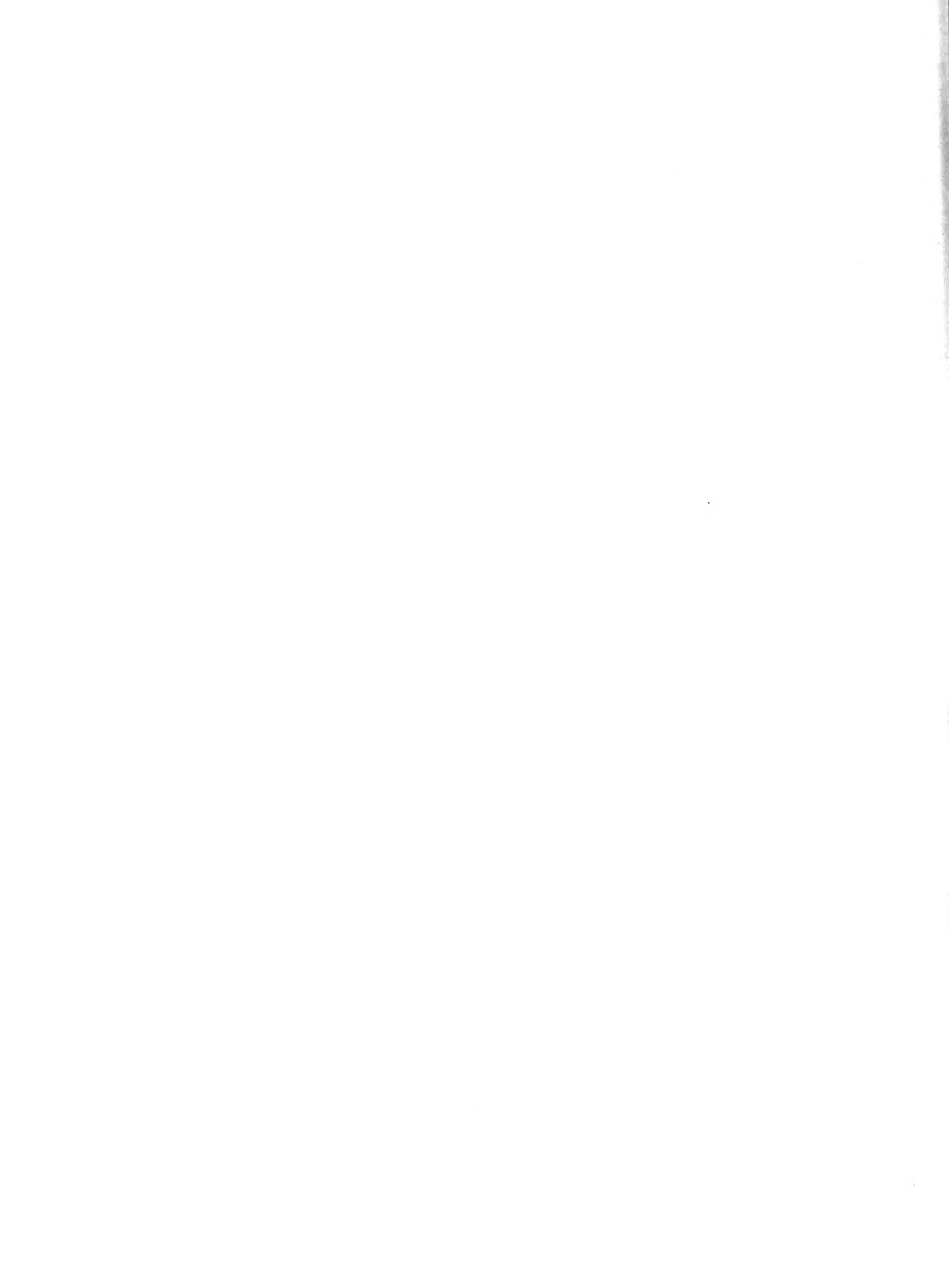
The Behind-the-Scenes Volunteer Program, whose recruitment and activities are coordinated by the center, continued to provide invaluable support to the Institution’s offices and bureaus. More than twelve hundred volunteers assisted in independent projects, and the program’s popular translation service expanded to include twenty-eight languages.

Written requests continued to arrive in significant vol-

ume. The Public Inquiry Mail Unit answered some forty-seven thousand requests for information, and it also began accessing the Smithsonian Institution Bibliographic Information Service. The Information Outreach Program initiated and coordinated several new projects. Highlights included: presentations for Voice of America and a cable television station's travel almanac; coordination of script and visual materials for Washington-at-a-Touch, a local company producing interactive information videos for use in Washington-area hotels and tourist attractions; participation in the National Tour Association marketplace, which netted contacts with more than fifty tour and travel companies; and oversight of a survey in Mall museums to assess the effectiveness of membership promotion activities. The survey was conducted through participation in the Management Analysis Office's summer Management Assistance Program.

Concerted efforts to increase the participation of minorities in the center's volunteer programs met with success. Seventeen percent of the 150 volunteer information specialists recruited in 1987 were members of minority constituencies. To meet the needs of the growing Hispanic community in Washington, D.C., the center provided taped information in Spanish during Hispanic Festival Week in July and during Hispanic Heritage Week in September. The center offered Smithsonian Orientation Programs in Spanish at the Adams Morgan Neighborhood Hispanic Festival and at the Tarde Hispana Celebration.

Results of the center's annual Institution-wide volunteer survey indicated that 5,244 volunteers contributed 457,243 hours of service to the Smithsonian in 1987.



ADMINISTRATION

John F. Jameson, Assistant Secretary for Administration

Administrative and Support Activities

Largely hidden from public view, the Institution's administrative and technical support offices provide services essential to the success of the Smithsonian's scholarly and public activities. These units are also responsible for central oversight, ensuring accountability in the use of financial, personnel, and physical resources. Fourteen offices and their numerous divisions carry out activities that span the Institution and range from budget formulation to building security.

Central administration costs, exclusive of those related to the care of facilities, remained relatively low in 1987, accounting for 7 percent of the Institution's federal and trust operating budget.

Office of Programming and Budget

On the basis of its review of the Institution's planning and budget processes, the Office of Programming and Budget (OPB) adopted new, integrative procedures. The OPB assumed responsibility for coordinating all planning activities and for preparing the Smithsonian's *Five-Year Prospectus*. Other changes, which were enacted with preparation of the federal budget request for the 1989 fiscal year and the 1988 and 1989 budgets for nonappropriated funds, foster greater discussion about plans and priorities. As a result, bureaus and offices now have more opportunities to identify common interests and promising areas for collaboration. The OPB increased its use of computers and other automation technology in developing budgets and the *Prospectus*. This translated into greater efficiency in processing and assembling budget submissions for the Office of Management and Budget. Moreover, detailed program and financial information is now more easily accessible, aiding decision making within the Institution and tightening the relationship between short- and long-range planning.

Office of Information Resource Management

The five-year-old Office of Information Resource Management (OIRM) continued its transition from a central data processing unit to a leader of distributed information management. In the evolving distributed system, bureaus and offices increasingly will use mini- and microcomputers that are linked to each other and the OIRM mainframe computer. An important component of this integrated arrangement is the Collections Information

System now under development. In 1987, the OIRM implemented a prototype system in the Division of Fishes at the National Museum of Natural History.

In a collaborative effort involving OIRM, the Office of Accounting and Financial Services, and the Office of Personnel Administration, the Institution's personnel and payroll system was successfully transferred to the National Finance Center, which is operated by the U.S. Department of Agriculture. This new arrangement will result in more comprehensive and more accessible information, and it will improve internal controls.

The OIRM also began augmenting the capabilities of the Smithsonian Institution Bibliographic Information System. Efforts focused on adding archival and research files, such as the *Inventory of American Sculpture*, a national data base being developed by the National Museum of American Art.

With the creation of a Communications Services Division, responsibility for telephone communications was transferred to the OIRM from the Office of Plant Services. Merging of data and telephone communications in the new division has resulted in improved coordination of these closely related activities.

The OIRM's Information Resource Center continued to expand its curriculum of computer and software courses, as well as its consultation services. The Institution-wide long-range information resource management plan, completed in 1986, was reviewed and updated. An important component of the planning effort was a study involving a wide range of Smithsonian staff, who helped define information needs in areas such as research, collections management, and public programs.

Office of Personnel Administration

The Office of Personnel Administration devoted much effort to implementing two major legislative acts—the overhaul of the Federal Employees Retirement System, which included establishment of the new Thrift Savings Plan, and the Immigration Reform and Control Act. Staff members also reviewed trust fund benefits for employees and scheduled changes that will be effective in fiscal year 1988. In addition, the office began contract negotiations in early fall 1987 with Local 400 of the United Food and Commercial Workers, which holds exclusive bargaining rights for unionized employees in the Business Management Office.

Office of Equal Opportunity

The Office of Equal Opportunity continued special efforts to recruit minorities, women, and disabled persons for positions in all employment categories. For professional, administrative, and technical positions, employment goals for minorities and women were established for each organizational level within the Institution. The proportion of professional and administrative positions filled by these two groups rose to 20.5 percent in 1987, and employment of disabled persons continued to increase. Additional gains are likely, as the office places a strong emphasis on outreach activities to inform target groups and their advocacy organizations of Smithsonian programs, exhibitions, and career opportunities. The interest and work of the Committee for a Wider Audience and of the Cultural Education Committee will enhance these efforts.

In 1987, the office conducted programs on sexual harassment for the majority of civil service and trust fund personnel. Sessions focused on defining and identifying sexual harassment in the workplace and on the responsibilities of managers, supervisors, and employees.

Office of Printing and Photographic Services

Taking, processing, and preserving photographs—in support of research and publications, for museum collections, for documenting the Institution's history, and for the needs of the public—are the primary responsibilities of the Office of Printing and Photographic Services. In addition, the office is the focal point of in-house printing activities at the Smithsonian.

The office operates a cold storage facility for archiving photographs. One of the most successful of its kind in the nation, the five-year-old facility is the repository for an enormous photographic collection that is growing at a rate of sixteen thousand to twenty thousand photographs annually. Plans for expanding the facility were initiated in 1987. Also during the past year, staff members tested a new toning solution that could eliminate a suspected carcinogen from laboratory processing. Additional tests are scheduled for 1988.

For the National Museum of American History, the office produced a videodisc of the Division of Transportation's Pullman Collection, Chaney Collection, and selected subjects related to railroads. The office also produced two videodiscs containing its files of 35-millimeter color slides. To stay abreast of new technology, the office

is experimenting with still video systems—to ascertain the equipment's value for collection management and to acquaint staff members with electronic still imaging.

In addition to its annual exhibition, "The Year in Pictures: As Seen from the National Museum of American History," the office mounted "The Vietnam Veterans Memorial: A National Experience." Created for the Smithsonian Institution Traveling Exhibition Service, the exhibition features seventy black-and-white photographs that capture the powerful and somber presence of the Vietnam Veterans Memorial in Washington, D.C. It will be on tour through mid-1989, and a second copy of the exhibition was produced to meet demand. In addition, the office prepared the book *Reflections on the Wall: The Vietnam Veterans Memorial*, which was published by Stackpole Press and is in its second printing.

Other Significant Activity

The Office of Procurement and Property Management provides technical services to ensure timely and cost-effective acquisitions essential to Smithsonian projects. In 1987, the office's staff supported such projects as construction of the terrace restaurant at the National Air and Space Museum, purchases of furnishings and interior work for the new museum complex in the Quadrangle, construction of the Tupper Research and Conference Center at the Smithsonian Tropical Research Institute, and the transfer of the Institution's personnel and payroll system.

Besides assessing the impact of new federal laws and programs on the Smithsonian, the Office of Congressional Liaison helped steer several important Institution-related initiatives through the legislative process. As the year drew to a close, an emerging proposal that would affiliate the Museum of the American Indian and the Smithsonian was the subject of increasing legislative activity.

The Management Analysis Office continued to identify and promote actions to strengthen internal controls. The office conducted several reviews of Institution units and activities, including those that might realize cost savings and efficiency improvements by hiring outside contractors to perform commercial-type functions traditionally carried out by Smithsonian staff. It also coordinated the placement of graduate and postgraduate students in business administration, who worked on important management projects at the Museum Shops, Visitor Information and Associates' Reception Center, and the Office of In-

formation Resource Management. The Management Analysis Office continued to publish a biweekly employee bulletin, which covers important and timely administrative matters.

As the principal unit responsible for organizing Institution-wide events and programs, the Office of Special Events coordinated several hundred activities in 1987, including a concentrated series of programs that celebrated the openings of the Sackler Gallery, the National Museum of African Art, and the Ripley Center. The office received nearly one thousand requests from outside organizations seeking to use Smithsonian facilities, granting only those that pertained to events closely related to the Institution's exhibition and education programs.

The Smithsonian Ombudsman, a position created in 1977, continued to assist employees with job-related problems, concerns, and complaints. During the past year, the ombudsman aided about 160 employees with problems ranging from work-environment concerns to personnel or payroll matters.

Helping Smithsonian employees and consultants arrange the most efficient and economical travel plans is the responsibility of the Travel Services Office. The office made travel arrangements for the 1987 Festival of American Folklife, as well as for participants in the growing number of symposia, conferences, and workshops organized by the Institution.

The Contracts Office handled negotiations for specialized contracts related to trust-funded operations and helped obtain federal grants and contracts for special programs and projects. The Office of Audits and Investigations, which reports to the under secretary of the Smithsonian, performs all internal and external audits and investigates any suspected fraud, waste, abuse, or white-collar crime by Institution employees or contractors. Carried out on a recurring basis, internal audits examine both federally funded and trust-funded activities. External audits conducted by the office scrutinize claims, cost proposals, and cost and pricing data pertaining to contracts, grants, and other financial agreements.

For the Office of Facilities Services, 1987 highlights included completion of design and construction of the Haupt Garden, the interior of the new Quadrangle museum complex, and numerous exhibits. Under the direction of the Office of Design and Construction, construction of the \$15 million terrace restaurant at the National Air and Space Museum was begun. The office also awarded the contract for construction of the Tupper Research and Conference Center at the Smithsonian Tropical Research Institute, concluded the first phase of

the master plan for a base camp to serve the Fred L. Whipple Observatory, and started the final phase of the restoration of the exterior of the Arts and Industries Building.

The Office of Plant Services continued to refine automated systems to increase staff efficiency. The installation of a local area computer network has provided the capability to standardize forms, reports, and maintenance data for the various divisions. The office also made strides in its energy conservation programs, reduced backlogs in requests for trades and crafts services, and completed analyses of the property records for all buildings owned or leased by the Smithsonian. Office staff members completed building inspections of six museums, allowing management to set maintenance and repair priorities. The automated facilities-monitoring program pioneered by the office continued to attract widespread attention, and it was the impetus for visits by numerous directors and conservators from museums around the United States.

In 1987, the Smithsonian Institution Proprietary Security System was fully established, completing a long-term effort by the Office of Protection Services. With the new system, the Institution owns all of the security devices in its facilities, improving control over information about alarm signals. As part of its efforts to safeguard the Institution's personnel, collections, and buildings, the Office of Protection Services assumed responsibility for all parking programs and developed plans for installing access controls at major facilities, which will save manpower and improve security. In other activities, the office sponsored successful employee-health programs on smoking cessation and on Acquired Immune Deficiency Syndrome. It also hosted and coordinated the 1987 International Conference on Museum Security. The 250 participants represented 175 U.S. museums and 35 foreign museums. The conference featured fifty speakers, who addressed topics ranging from art theft to construction security. A week-long postconference tour visited museums between Washington, D.C., and New York City.

Reorganized in January 1987, the Office of Environmental Management and Safety (formerly the Office of Safety Programs) contains three major divisions: fire protection, occupational and visitor safety, and environmental management. During the past year, the office placed emphasis on measures to ensure compliance with the growing number of regulations regarding air and water quality, hazardous waste management, and industrial hygiene. It expanded its safety training program for Smithsonian employees, while continuing work on asbestos

Smithsonian Institution Women's Council

abatement; improvement of the Institution's fire-protection, detection, and suppression systems; and elimination of safety hazards in the physical plant. Also in 1987, the Office of Environmental Management and Safety began planning a major outreach program to share its expertise in museum safety.

The Office of Architectural History and Historic Preservation completed its catalogue of the architectural drawings of the Hirshhorn Museum and Sculpture Garden. It also finished its investigation of the architectural history of the National Zoological Park, which dates back to 1930. The office oversaw refurbishment of the Meeting and Regents rooms in the Smithsonian Institution Building, and it conducted "Perspectives on Preservation" seminars to acquaint Smithsonian staff with preservation practices. A major accomplishment of the office in 1987 was the restoration of the South Tower Room of the Smithsonian Institution Building. Originally conceived as a "children's museum" by former Smithsonian Secretary Samuel P. Langley in 1901, the room was designed by Grace Lincoln Temple, Washington's first woman interior designer.

Established in 1972, the Smithsonian Institution Women's Council identifies and studies the concerns of employees, advises management on women's issues, and strives to improve working conditions. Chaired by Carolyn Jones and composed of twenty members elected by Smithsonian staff, the council is particularly concerned with ensuring the equal treatment of women at the Institution. It holds open meetings on the second Wednesday of each month in the Regents Room of the Castle.

Four standing committees—Benefits and Child Care, Newsletter, Outreach, and Programs—carry out most of the council's tasks. Ad hoc committees are created as needed to further council goals. In 1987, the council continued its efforts toward establishment of child care centers at the Smithsonian for the children of Institution employees. The council cooperates with the newly formed Child Care Advisory Board, and two members serve on the board. The council also continued to develop the Women in Museums Network. In addition, the council redesigned its newsletter, "Four Star," and revised its constitution and bylaws.

Smithsonian Internship Council

Six years old in 1987, the Smithsonian Internship Council provides a forum for Institution staff working with interns, who number about five hundred annually. Made up of at least one member from each bureau and office, the council works to set common standards for internship programs and to improve coordination of these programs throughout the Institution.

The council has produced several publications, which are periodically updated, to assist staff members, interns, and fellows. *Internships and Fellowships* lists the majority of internship and fellowship opportunities at the Smithsonian. *The Handbook for Smithsonian Interns* describes procedures to be followed by interns, contains information about Smithsonian facilities, and lists services and activities available to interns. *Housing Information for Interns and Fellows* lists short-term housing available in the Washington, D.C., metropolitan area.

The council's staff assistant registers all interns and provides identification credentials and orientation. The assistant also regularly prepares reports about interns and their respective programs. These services are performed for both the Institution and the Woodrow Wilson International Center for Scholars.

At the beginning of the year, Ralph Rinzler, assistant secretary for public service, became the council's spokesperson to the Smithsonian's Management Committee. Also in 1987, the council revised its originating charter, Office Memorandum 820, to reflect current internship-program policies and procedures at the Institution. The council's Staff Orientation Committee made presentations to the Joseph Henry Papers project, Smithsonian Institution Archives, and Office of Architectural History and Historic Preservation.

The council formed the Intern Information Review Committee to review and develop standardized materials describing internship opportunities at the Smithsonian. An Outreach Committee also was formed. The committee is developing a central mailing list of universities, career centers, community centers, and related organizations, and it is exploring ways to attract members of groups that are underrepresented in Smithsonian internship programs.

Members of the council developed the agenda and served as instructors for the Office of Museum Programs workshop "Developing and Managing Effective Internship Programs," which was held in April. In July, interns from various Smithsonian offices were invited to discuss their experiences and impressions with the council. The interns' concern about inadequate financial support underscored the importance of the council's continuing efforts to establish a central stipend to help support interns.

DIRECTORATE OF INTERNATIONAL ACTIVITIES

John E. Reinhardt, Director

Directorate of International Activities

An array of programs monitor, coordinate, and seek to enhance the Smithsonian's many and varied international endeavors. While aimed at furthering cultural and scientific exchanges between the United States and other nations, International Activities* programs are not confined to endeavors undertaken in other countries. A major emphasis is to broaden the American public's understanding of the histories, cultures, and natural environments of regions throughout the world. These efforts were greatly strengthened in 1987 with the opening of the International Center in the S. Dillon Ripley Center of the Smithsonian's new museum complex. The International Center's new home contains the 5,200-square-foot International Gallery and conference rooms.

The center's debut and notable accomplishments of the Institution's international activities are described below.

International Center Programs

The new International Center occupies an important niche in the Institution, bringing to the public the fruits of Smithsonian research and expertise in explicating the world's cultural and natural diversity. A tandem goal of the center's programs, planned by center staff in coordination with other Smithsonian bureaus, is to foster two-way relationships with scholars and museum professionals in other nations. Staff pursue these goals through exhibitions, performances, film showings, lectures, conferences, seminars, and workshops.

"Generations," the inaugural exhibition in the International Gallery, exemplifies the aims of the new center's programs. Developed with the insights and expertise of many Smithsonian scholars and featuring specimens from numerous Institution collections, the provocative exhibition explains how various societies welcome and nurture their newborns. An ideal vehicle for demonstrating the diversity of cultures worldwide, the exhibition explores the arts, rituals, and folklore of birth and infancy from ancient times to the present.

Beginning in 1987, a series of public forums, "Face to Face with the Next Generation," builds on the themes of the exhibition. Featuring international experts, these forums examine the future of the world's children, addressing such issues as health concerns and the role of families in the education and development of the young. Film

programs and participatory activities for families were also planned.

Another major exhibition, "Tropical Rain Forests: A Disappearing Treasure," will open in the International Gallery in May 1988. The exhibition will focus attention on the Earth's most biologically diverse habitat, now besieged by forces of destruction. Organized by the Smithsonian Institution Traveling Exhibition Service, "Rain Forests" will be cross-disciplinary, drawing upon and illustrating the research programs of several Smithsonian bureaus and outside organizations. Like "Generations," this exhibition will be complemented by an array of educational programs while at the International Gallery and at the twelve other sites on its scheduled tour. Funding from the MacArthur Foundation will support exhibition development, as well as educational programs at the Smithsonian and tour sites.

Fittingly, "Rain Forests" will open during an unprecedented research effort that promises to increase understanding of the critically important ecosystem. In 1986, the International Center, the National Museum of Natural History, and the Man and the Biosphere Program of the United Nations Educational, Scientific, and Cultural Organization launched an ambitious program to inventory the flora and fauna of Amazonia. In September 1987, fifteen Smithsonian and eighteen Latin American scientists began work in the Beni Biosphere Reserve, a 135,000-hectare expanse of subtropical forest near La Paz, Bolivia. This project and the others to follow will provide the methodology for inventorying and studying the millions of plant and animal species, many of them unknown, that are threatened with extinction because of development pressures. An important component of the program is training of biologists, other scientists, and students from other countries. The first workshops were held in Bolivia and Peru during the fall of 1987.

International Exchanges and the Smithsonian Foreign Currency Program

In the second year of the Smithsonian's new International Exchange Program, nine projects—workshops, training courses, and other short-term activities—were initiated, involving a total of five Smithsonian bureaus and scholars from eleven countries. Moreover, the Suzanne Liebers Erickson memorial fund supported a second year of exchange visits between Smithsonian staff members and Danish scholars, museum professionals, and students.

Awards from the Smithsonian Foreign Currency Pro-

*After Dr. Reinhardt's retirement on July 31, 1987, the Directorate became the Office of International Activities reporting to the Assistant Secretary for Research.

gram in 1987 supported research in Burma, Pakistan, Yugoslavia, and India. In some countries, the United States held blocked currencies derived from past sales of agricultural commodities under Public Law 480; in others, post-Public Law 480 programs made local currencies available. Since 1965, the Smithsonian has administered the disposition of blocked currencies to support studies by researchers from the Smithsonian and other U.S. institutions. Research supported last year included studies of Indian drumming theory, archaeological and paleontological exploration in India and Pakistan, and anthropological investigations of Yugoslavia's island populations.

Office of Service and Protocol

The role of the Office of Service and Protocol (OSP) is to attend to the formal and logistical details involved in international exchanges between the Smithsonian and foreign governments and institutions. For example, the office assisted in the preparation of formal protocols of cooperation between the Institution and governmental agencies of the Soviet Union and Iraq—both signed during the past year.

The OSP also provides a variety of services to Smithsonian bureaus. In 1987, it arranged visits to the Smithsonian for 149 foreign officials and scholars and provided documentation and guidance to 150 foreign exchange visitors. The office also obtained ninety-six passports and 1,117 foreign visas for Smithsonian staff members and grant recipients. As part of its responsibilities, the OSP carried out a variety of immigration-related services to the Institution, including implementation of personnel procedures mandated by the Immigration and Reform and Control Act of 1986. In addition, the office developed procedures for emergency evacuation of personnel from field research sites.

The second edition of the OSP's *Profile of the International Activities of the Smithsonian* was prepared in 1987. Twice as large as the first edition, the new volume describes the Institution's foreign research and exchange activities during 1985 and 1986.

The office served as the Institution's liaison in planning for several major international projects. It began preparations for the Smithsonian's possible participation in the 1990 U.S. Festival of Indonesia, and it participated in government-level discussions concerning the Bicentennial of the 1787 U.S.–Morocco Treaty of Peace and Friendship. The OSP also continued to coordinate Smithsonian activities related to the 1988 Australian Bicentennial, as

well as those stemming from Secretary Adams's initiatives for exchange programs with Japan and the Soviet Union.

Exchanges and cooperative programs with the Soviet Union increased during the past year, and the number is likely to grow. In November 1986, the exhibition "Russia, The Land, The People: Russian Painting, 1850–1910" opened at the Renwick Gallery. During an April 1987 trip to Moscow, Secretary Adams signed a protocol of negotiation with the Soviet Ministry of Culture. The OSP assisted in concluding arrangements for the upcoming exhibition "Crossroads of Continents," which will feature cultural objects from the Soviet Union, Canada, and the United States. The Hirshhorn Museum and Sculpture Garden and other Smithsonian bureaus are exploring opportunities for cooperative exhibitions with the Soviet Union.

In addition to the Soviet Union, Secretary Adams visited Israel, Japan, and Mexico as part of an effort to develop long-term exchange programs with those nations. Japanese officials followed up with a visit to the Smithsonian in September 1987.

Also during the past year, the OSP collaborated with the Office of Interdisciplinary Studies in planning an international colloquium on "Science, Ethics, and Food," which took place at the Smithsonian in October 1987.

Office of Publications Exchange

Since it was established by Joseph Henry, the first Secretary of the Smithsonian, the Office of Publications Exchange (OPE) has been an important link between scholarly communities in the United States and those in other countries. The office sends books, journal articles, and other scholarly materials published in the United States to interested foreign agencies and organizations, which, in turn, send their materials to OPE for distribution here. In 1987, OPE handled 104,720 packages from 149 domestic institutions for transmission abroad and 25,200 packages from 220 foreign institutions for distribution in the United States.

Columbus Quincentenary Planning

Observance of the five-hundredth anniversary of Columbus's first voyage to the New World in 1492 will span the entire Institution and will include contributions from countries on both sides of the Atlantic Ocean. Rather than celebrating the anniversary of the "discovery," the

Institution's commemoration will highlight five centuries of experience in the Western Hemisphere from the perspective of continuing encounters between peoples. Through a broad array of exhibitions and programs for the general public and scholars, a much more complex picture of the relationships that evolved between indigenous peoples of the Americas and European groups will be provided.

Although the anniversary is five years away, planning for the observance progressed significantly in 1987. Bureaus, which are developing their own programs within broad outlines established by the Institution and the Quincentenary Program, have already announced the themes of their exhibitions and related programs, a few of which are briefly described below.

Through a permanent exhibition, temporary exhibits, and related programs, the National Museum of American History will explore the social and economic relationships between European and indigenous populations during the seventeenth century and the early part of the eighteenth century. The National Museum of Natural History has begun work on a major temporary exhibition, "Seeds of Change," that will examine exchanges of plants, animals, and even diseases between countries and hemispheres. The Smithsonian Institution Traveling Exhibition Service is developing a traveling exhibition on the iconography of Christopher Columbus, and the National Air and Space Museum is planning a world atlas composed of photographs taken by satellites. The Cooper-Hewitt Museum plans to illustrate the influence of Native American design on European and American decorative arts through an exhibition of ceramics, textiles, metalwork, and architectural designs.

Programs planned for the International Center will concentrate on the cultures of past and present peoples of Latin America. Beginning in 1987 and continuing through 1993, the International Center will organize scholarly seminars and conferences, as well as symposia, lectures, exhibitions, and performances for the general public. During the past year, planning began for the first in a series of Quincentenary conferences intended to foster understanding of Latin American cultures, which will guide development of public programs for the anniversary observance. The initial conference, on "Music of the Americas," will examine themes of exploration and encounter expressed in music as it evolved after 1492.

In September 1987, the National Museum of Natural History and the International Center sponsored "Americans before Columbus: Ice Age Origins," a public symposium focusing on the first human migrations to the New

World. With the Office of Public Affairs, the center also sponsored a press briefing to acquaint Hispanic journalists with the Smithsonian's Quincentenary plans. In addition, an International Center reception honored visiting members of the Spanish and Italian Quincentenary commission and of the United States Christopher Columbus Quincentenary Jubilee Commission.

Other Events

Several interdisciplinary conferences addressing issues of international concern were held in 1987. One Smithsonian-sponsored conference examined "commons" of South Asia. Representatives of the Smithsonian, Social Science Research Council, and American Council of Learned Societies discussed a long-term program for studying the human and ecological dynamics of South Asia's communally owned tracts. Participants decided to begin with a case study of the Sundarbans of Bangladesh, a well-studied area. A follow-up workshop, to be held in November 1987, will review the current knowledge of the Sundarbans and assess the potential for a cooperative field project.

Planning of an international conference on studies of the material cultures of Africa progressed. Funding from the Rockefeller Foundation was secured. Scholars from sub-Saharan Africa, North America, and Europe will meet in Bellagio, Italy, in May 1988 to explore the study of material products in relation to the societies, politics, and cultures in Africa.

Final details were completed for a series of small exhibitions to be held in the International Center's conference rooms. The first, a photographic show sponsored with the Council of American Overseas Research Centers, will be "Sojourners and Settlers: Yemeni Workers at Home and Abroad," opening in October 1987.

MEMBERSHIP AND DEVELOPMENT

James McK. Symington, Director

Office of Membership and Development

The Office of Membership and Development is responsible for fund-raising activities that support Institution-wide projects, and it assists bureaus as they mount programs to achieve their individual development goals. While some bureaus use the full range of the office's services, others are evaluating their private funding needs and have begun recruitment of their own development officers, continuing a pattern of decentralization begun several years ago. The National Museum of Natural History, for example, conducted a comprehensive management review and has organized several task forces to implement the study's recommendations, including several related to fund raising; and the National Zoological Park selected a development officer, the first hired by a Smithsonian bureau.

In 1987, as a new initiative, all bureaus and offices prepared annual development plans, detailing their private funding needs and goals. For the Smithsonian's Management Committee, these plans will permit more systematic evaluation of the entire Institution's funding needs from both federal and private sources. This information also will assist the Development Committee, which was formed in 1986, in setting fund-raising priorities, and it will help the Office of Membership and Development coordinate activities across the Institution.

Accomplishments of selected development efforts in 1987 are detailed below.

Highlights

The year ended with a grand series of events marking the opening of the new museum complex. The celebratory activities highlighted a major milestone in the Institution's development and provided another opportunity to thank the more than thirty-eight thousand individual, foundation, and corporation donors whose contributions made the complex a reality. The National Museum of African Art, Arthur M. Sackler Gallery, S. Dillon Ripley Center, and Enid A. Haupt Garden greatly enhance the Institution's service to the public and are impressive reminders of the importance of private donors to furthering the Smithsonian's goals.

The past year also marked the successful completion of the campaign to fund construction of the new Visitor Information Center. The Pew Memorial Trust awarded a grant of \$1 million and the Kresge Foundation issued a challenge grant of \$500,000. Contributing Members and the National Associate Board—together with the Morris

and Gwendolyn Cafritz Foundation and the James Smithsonian Society—responded generously with gifts and pledges exceeding \$1.6 million. Construction of the center will begin in fall 1987.

With major grants from the John D. and Catherine T. MacArthur Foundation, the Smithsonian Institution Traveling Exhibition Service will mount an exhibition that focuses on the alarming demise of tropical rain forests. Scheduled to open in May 1988, the exhibition will be the second to open in the International Gallery of the new Ripley Center and, afterward, will tour the country. Aid from the foundation also is supporting development of local educational programs.

Ongoing efforts to obtain private funding for two major exhibitions on information technology—"The Information Revolution" at the National Museum of American History and "Computers and Flight" at the National Air and Space Museum—reaped major contributions. Principal new donors included EDS, the Digital Equipment Corporation, Unisys, Intelsat, the Xerox Corporation, and Molex.

Programs and exhibitions in the arts also were the beneficiaries of private gifts and donations. The Cigna Corporation is supporting "American Colonial Portraits: 1700-1776," a major exhibition scheduled to open in October 1987 at the National Portrait Gallery. Credit Suisse and the Xerox Corporation will help fund a major exhibition on Swiss sculptor and painter Alberto Giacometti at the Hirshhorn Museum and Sculpture Garden. A major grant from the Andrew Mellon Foundation will further efforts by the Archives of American Art to produce a retrospective catalogue of its collection. Contributions from the Armand Hammer Foundation have fostered a program for the exchange of art exhibitions between the United States and the Soviet Union. The initial phases of the National Museum of American Art's project to inventory all American sculpture are being supported by the Henry Luce Foundation. In addition to underwriting production of an orientation film for the new Visitor Information Center, the Cafritz Foundation continued its long-time support for the Institution by contributing to the purchase of a 1785 portrait of Benjamin Franklin for the National Portrait Gallery.

The Clark-Winchcole Foundation, another long-time benefactor, awarded a grant to aid development of the planned Smithsonian Child Care Center. The Martin-Marietta Corporation completed its three-year pledge of support for the Space History Chair at the National Air and Space Museum. "A Material World," a major exhibition scheduled to open at the National Museum of Amer-

James Smithsonian Society

ican History in April 1988, will benefit from a major grant from the DuPont Corporation.

Among the new corporate donors in 1987 was All Nippon Airways, which supported the exhibition of Gary Larson cartoons at the National Museum of Natural History and underwrote part of the new "Invertebrate Exhibit" at the National Zoological Park. The Smithsonian's symposia commemorating the Bicentennial of the Constitution are made possible by grants from a number of corporations and foundations. Organized by the Office of Interdisciplinary Studies, one symposium was held in May 1987; another is scheduled for March 1988.

Largely because of the retirement of Cooper-Hewitt Museum Director Lisa Taylor, the capital campaign to fund expansion of the New York City museum was suspended temporarily, resuming when a new director is appointed. Meanwhile, work progressed on a fund-raising campaign to support acquisitions by the National Museum of African Art.

Staff Changes

In 1987, the office increased its research and recordkeeping staff by two, an expansion that will broaden support for development activities undertaken by Smithsonian bureaus. The staff's efforts will benefit from a new computerized recordkeeping system that the office is implementing.

Ilene Rubin resigned from her position as development officer assigned to the Archives of American Art. Development officer Salvatore Cilella, Jr., resigned to become director of the Columbia Museum in South Carolina.

Founded in 1977 as the highest level of the Contributing Membership of the Smithsonian Associates, the James Smithsonian Society has given more than \$2 million to support Institution projects. In 1987, the contributions of Annual Members allowed the society to make awards totaling \$265,217, which advanced the efforts of bureaus and offices throughout the Smithsonian. Projects benefiting from these awards are listed at the end of this section.

Annual Meeting

The Smithsonian Society's annual meeting was held on September 26 in conjunction with the fall meeting of the National Board of the Smithsonian Associates. Society and board members were given special tours of the Arthur M. Sackler Gallery, National Museum of African Art, and Enid A. Haupt Garden, followed by a luncheon held in their honor at the official residence of Japanese Ambassador H. E. Nobuo Matsunaga.

At a formal dinner at the National Air and Space Museum, the Smithsonian Society Founder Medalists were announced. Herbert R. Axelrod, scientist and publisher of pet and music books, was recognized for his major contributions to the National Museums of American History and Natural History, which included creation of the Leonard P. Schultz Fund in support of ichthyology, republication of the rare nineteenth-century *Atlas Ichthyologique*, and the long-term loan of the Axelrod Stradivarius quartet for special performances. Founder Medals also were awarded to Phillip and Patricia Frost, of Miami Beach, Florida, for the gift of their extraordinary collection of American abstract art to the National Museum of American Art. Medalist Herbert Waide Hemphill, Jr., a founder of the Museum of American Folk Art in New York City, was honored for the gift of his outstanding collection of American folk art to the Museum of American Art.

Awards

In 1987, the Smithsonian Society awarded grants to support the following projects.

National Museum of African Art: Acquisition of an *akua'ba* figure by the Asante people of Ghana.

Hirshhorn Museum and Sculpture Garden: Purchase of projectors and screen.

National Portrait Gallery: Purchase of a portrait by Gilbert Stuart.

National Board of the Smithsonian Associates

Office of the Committee for a Wider Audience: Paid and public service advertising aimed at groups underrepresented at Smithsonian programs.

Smithsonian Institution Press: Production of *A New View of the Castle* by Edwards Park.

National Air and Space Museum: Purchase of a prefabricated structure for storage of Movietone footage and transfer of aerospace films to videotape.

Smithsonian Astrophysical Observatory: Production of an introductory videotape on the Whipple Observatory and conversion of a three-dimensional map of the galaxies from videotape into graphics.

National Museum of Natural History: Development of a computerized inventory of the Department of Anthropology's North American ethnology collections; continued operation and staffing of the "Paleo Prep Lab"; production of a mural-size oil painting for the exhibition on micro-ecosystems; and production of an introductory film for the exhibition "Crossroads of Continents," scheduled to open in September 1988.

National Zoological Park: Study of the "Smokey the Bear" exhibit to identify ways to improve the welfare and exhibit of bears in zoos.

Smithsonian Tropical Research Institute: Reopening of a road to Soberania National Park, providing needed access for researchers.

Offering points of contact with the Institution's broad constituency, the National Board of the Smithsonian Associates promotes the Institution's research and educational activities and its acquisition programs. The National Board meets semiannually for an update on Smithsonian activities and on issues confronting the Institution.

At its spring meeting, held in Tucson, Arizona, the board toured the Smithsonian's Whipple Observatory on Mount Hopkins. Staff members gave a thorough briefing on the observatory's programs and demonstrated its multimirror telescope. Earlier, members toured Biosphere II, a project directed by Ed Bass, son of board member Perry Bass. Business matters included a discussion with Smithsonian Secretary Adams to learn more about current issues and election of new members. Elected to the board were Mrs. Cummins Catherwood, Bryn Mawr, Pennsylvania; the Honorable Ulric St. Clair Haynes, Jr., New York City; Mr. John W. Morrison, Minneapolis, Minnesota; Mrs. John D. Rockefeller, IV, Washington, D.C.; and Mr. T. Evans Wyckoff, Seattle, Washington. Following the meeting, several members joined Secretary Adams on a study tour of the Southwest. In Phoenix, Arizona, the first tour stop, the group was hosted at a dinner at the Heard Museum by board members Mr. and Mrs. Jack S. Parker, Mrs. Gay F. Wray, and the Honorable and Mrs. John R. Norton III.

The National Board's autumn meeting, traditionally held in Washington, D.C., featured a preview tour of the National Museum of African Art and the Arthur M. Sackler Gallery on September 26. Japanese Ambassador H. E. Nobuo Matsunaga hosted a post-tour luncheon for members of the board and James Smithson Society. At the annual National Board-Smithson Society dinner, held in the National Air and Space Museum, board members viewed a display describing projects recently funded by the society.

The following day's activities included discussions with Secretary Adams at the National Portrait Gallery, providing an opportunity for members to become better acquainted with the Smithsonian. Finally, the members attended the Regents black-tie reception celebrating the official opening of the new museum complex.

Smithsonian National Associate Program

Serving more than two million members, the Smithsonian National Associate Program, begun in 1970, offers innovative educational opportunities throughout the nation, expanding the boundaries of the Institution to encompass all fifty states. The program's far-flung membership is kept abreast of the Institution's activities through *Smithsonian* magazine. This continuing awareness and opportunities for personal involvement with the Institution through the diverse range of activities organized by the program in cooperation with other bureaus have fostered a strong national constituency for the Smithsonian's work.

A sampling of the activities and accomplishments of the program's three units is presented below.

Contributing Membership

The Contributing Membership provides unrestricted funds to support Smithsonian research, education, and outreach programs. This financial support is a combination of annual membership dues and corporate matching funds. In addition, Contributing Members have responded generously to special fund-raising appeals to support specific projects. Participation is through six levels of annual membership: Supporting (\$60; available only to members who live outside the Washington, D.C., metropolitan area); Donor (\$125); Sponsoring (\$300); Sustaining (\$600); Patron (\$1,200); and the James Smithsonian Society (\$2,000).

Since it was established in 1976, the Contributing Membership program has grown steadily, counting 44,800 members in 1987, or 8 percent more than the previous year. Eighty-nine percent of this total reside outside the Washington, D.C., area. Total membership income also continues to increase. The \$3.6 million in net gain to the Institution in 1987 topped the 1986 total by 61 percent. More than \$1 million of the 1987 total came from Contributing Members' strong response to a special appeal for funds to support construction of the new Visitor Information Center in the Castle.

The Institution expresses its appreciation to the Contributing Membership through a variety of benefits and special programs. In 1987, members were invited to attend ten exhibition previews and receptions, including "Engines of Change: The American Industrial Revolution, 1790-1860," at the National Museum of American History; "Portraits of Nature: Paintings of Robert Bate-man," at the National Museum of Natural History; "Modern American Realism: The Sara Roby Collection"



Contributing Members of the Smithsonian National Associate Program enjoy the Michigan gospel singers' performance during the special membership evening at the Michigan Program of the 1987 Festival of American Folklife, July 1, 1987.

and "John La Farge" at the National Museum of American Art; "American Art Deco," at the Renwick Gallery; and "Berlin 1900-1933: Architecture and Design," at the Cooper-Hewitt Museum. Among the other special events held for Contributing Members were private tours of the Arthur M. Sackler Gallery, National Museum of African Art, and International Gallery, as well as a "Victorian Evening" in the Enid A. Haupt Garden.

Contributing Members also received several complimentary books in 1987, in addition to the *Smithsonian Engagement Calendar*. Those who live within the Washington, D.C., area are automatically enrolled in the Resident Associate Program. Members in outlying regions receive *Smithsonian Institution Research Reports*, published three times a year by the Office of Public Affairs to highlight special research and education projects underway. And in 1987, for the first time, members outside metropolitan Washington received a Smithsonian poster as a new membership benefit.

Members again participated in the annual "Smithsonian Treasures" tour, an exclusive, behind-the-scenes visit to the Institution. The five-day tour was designed by the Associates Travel Program. Other benefits are offered in conjunction with the Lecture and Seminar Program, which organizes activities in communities across the na-

tion. Contributing Members are offered priority registration, complimentary tickets to one lecture, and often an invitation to an informal reception following the lecture.

Lecture and Seminar Program

The Lecture and Seminar Program, twelve years old in 1987, brings the Smithsonian's research and its collections to the National Associates and to interested members of the general public in about twenty U.S. communities each year. Lectures, seminars, and hands-on workshops are led by Smithsonian curators, scientists, and research associates.

During the past year, more than 630,000 families were invited to attend activities organized by the program. Events were held for the first time in Fort Worth and Lubbock, Texas; Jacksonville, Florida; Lake County, Illinois; Marin and Sonoma counties and Los Angeles, California; Topeka, Kansas; Madison, Wisconsin; Pleasantville, New York; and Greenwich, Connecticut. Building on the successes of previous years, the program returned to Midland and Houston, Texas; Gainesville, Florida; Boone, North Carolina; Oshkosh Wisconsin; and Oakland, California. In four communities—Topeka, Boone, Oshkosh, and Madison—mayoral proclamations were issued in honor of the visit by Smithsonian representatives.

The success of activities organized by the Lecture and Seminar Program depends in part on collaborations with local and national organizations. In 1987, the program collaborated with 127 local organizations, including museums, universities, zoological parks, and botanical gardens. National groups that cosponsored activities included United Airlines; the National Trust for Historic Preservation; the American Association of Retired Persons; Sigma Xi, the Scientific Research Society; and the World Wildlife Fund.

In cooperation with other bureaus, the program developed thirty-two new lectures and seminars for 1987. Among these were "Living and Working in Space," taught by Lillian Kozloski, research assistant in the Space Science and Exploration Department of the National Air and Space Museum; "Roots of Afro-American Culture, 1780-1820," taught by Fath Davis Ruffins, historian in the Department of Social and Cultural History at the National Museum of American History; and "Civil War America," taught by two National Portrait Gallery staff members—William Stapp, curator of photographs, and Wendy Wick Reaves, curator of prints.

Several intensive week-long seminars, an activity begun in 1986, were held during the past year. Examining topics ranging from the past and future of space exploration to Native Americans in U.S. history, these in-depth programs were held in Oshkosh, Wisconsin, and at Appalachian State University in Boone, North Carolina, and the University of Wisconsin-Madison.

Toronto, Canada, was the site of the program's 1987 international series. In celebration of the Royal Ontario Museum's seventy-fifth anniversary, the program offered a five-day series of activities. Future international programs include a return to Tokyo, Japan, scheduled for October 1987. The program, which follows a successful debut in 1985, is being cosponsored by the MYC Cultural Exchange Institute of Japan. Events during the coming year are also planned for Australia and Denmark.

Other facets of the program included several week-long seminars held in Washington, D.C. In these seminars, Associates from throughout the United States study with Smithsonian curators and participate in behind-the-scenes tours of the museums. Topics explored in the twelve seminars offered in 1987 ranged from post-World War II aviation to photojournalism.

Associates Travel Program

The Associates Travel Program organizes educational tours that mirror the many and varied interests of the Institution. In 1987, a total of 7,000 National Associates participated in the 101 foreign and domestic tours offered by the program. And since the program's inception in 1975, more than 73,000 Associates have embarked on program-organized journeys. The educational value of each outing is enhanced by carefully chosen study leaders. One or more Smithsonian staff members also are present on each trip.

Foreign Study Tours span the globe, offering a wide variety of destinations and many unique learning experiences. For example, a tour focusing on the performing arts of Russia and featuring back-stage visits was one of the new program offerings in 1987. Also introduced during the past year was a tour of national parks in Kenya and Tanzania, where Associates observed African wildlife, met with animal researchers, and discussed conservation efforts; and a tour of Malaysia, Singapore, and Borneo examined the islands' history, arts, flora, and fauna, and included a stay in a longhouse in Sarawak.

Associates also retraced historic sea routes and learned about early explorations as they sailed on the four-

masted barque *Sea Cloud* on her first Pacific voyage. On their journey, Associates traveled through the Panama Canal en route to the Galapagos archipelago and then embarked on an eight-day sail to Easter Island, where they studied the mystical colossal figures that date back to ancient times. In another Pacific expedition, participants traveled on the cruise ship *Illiria* from Papua, New Guinea, to the Solomon Islands, the New Hebrides, and Fiji. The tour featured lectures on the region's natural and cultural history and on World War II battles fought in the area.

On other study voyages, Associates explored history and geology while visiting Iceland, Greenland, and Canada's Maritime Provinces, and during a cruise on the Rhone River, they learned about French art and literature. A trip from Rio de Janeiro, Brazil, around Cape Horn, and to Santiago, Chile, examined the history and current politics of Latin America.

Among the thirteen tours offered in China were the popular "China by Train," "Decorative Arts and Antiques in China," and "Hiking China's Sacred Peaks." Associates also explored Tibet on a tour that included an overland trip to Nepal. Other travelers flew to Japan, cruised to the Soviet Union and then boarded the Trans-Siberian Express for a trip to Moscow, with a stop in either Outer Mongolia or Soviet Central Asia.

Countryside programs in 1987 offered the opportunity to live in small towns in Hungary, England, Italy, Switzerland, Austria, or France. Residential seminars included programs on Austrian history and art in Vienna and Salzburg, as well as on Japanese art, music, and culture in Kyoto. And at the ninth annual Oxford/Smithsonian Seminar, Associates could choose from a variety of specially designed courses in the arts and sciences.

The forty-four Domestic Study Tours offered in 1987 provided Associates with numerous opportunities to experience the natural wonders and regional heritage of America. Of the two new domestic cruises, which increased the total number of offerings to five, one featured visits to historic ports between Philadelphia, Pennsylvania, and Savannah, Georgia, and the other, led by Porter Kier, former director of the National Museum of Natural History, introduced Associates to marine biology on a voyage to the Virgin Islands.

Trips on land covered virtually all parts of the United States. One of the most popular destinations was Santa Fe, New Mexico, the site of two different programs on Spanish and Indian cultures. Secretary Adams led a group of members of the National Board of Smithsonian Associates on a study tour of the Southwest.

Tours of National Parks, which in 1987 included Bryce, Zion, Arches, and Canyonlands, remained popular. A novel offering was a journey on horseback over a stretch of the Lewis and Clark trail in Idaho, which was led by Herman Viola, director of Quincentenary Programs at the National Museum of Natural History.

Special weekend programs at the Institution—including the fifteenth annual "Christmas at the Smithsonian Weekend"—were organized for National Associates and National Air and Space Associates. In addition, more than three thousand associates participated in the "Washington Anytime Weekend," organized in cooperation with the Visitor Information and Associates' Reception Center. The program includes a behind-the-scenes tour of the Castle and offers guidance and information to visiting associates.



A Contributing Member of the Smithsonian National Associate Program studies objects included in the exhibition "Engines of Change: The American Industrial Revolution, 1790-1860," during a special membership evening at the National Museum of American History, December 1, 4, and 7, 1986.

Smithsonian Resident Associate Program

Emulated by museums and universities in the United States and throughout the world, the Smithsonian Resident Associate Program (RAP) directly involves residents of the Washington, D.C., area in the activities and interests of the Institution. Through the program's activities, the individuals and families comprising RAP's fifty-eight thousand memberships and other members of the public can partake more fully in the many cultural and educational opportunities afforded by the national museums. The program's collaborations with international, national, and local organizations enhance the quality of its diverse offerings, and through arrangements with the C-SPAN network, Voice of America, and WORLDNET, many RAP activities are made available to growing national and international audiences.

In 1987, RAP offered nearly 1,800 innovative activities—performances, lectures, films, tours, and others—that were attended by a total of more than 260,000 people. Also during the past year, the program moved its offices to the new S. Dillon Ripley Center, where it has access to the Education Center's classrooms and auditorium, which RAP manages for the Institution. And in September 1987, *The Associate*, the monthly publication that describes upcoming RAP activities, was redesigned, completely changing its fifteen-year-old look.

RAP continued to boast a high membership retention rate. Despite a dip during the first five months of the year because of suspension of parking privileges, nearly 80 percent of Resident Associates renewed their membership in 1987. Almost entirely self-supporting, the program received small subsidies from the Institution for Discovery Theater and performing arts activities. In addition, grants from local and national foundations and corporations enabled RAP to carry out special activities and outreach projects that would not have been possible otherwise.

To commemorate the opening of the new Smithsonian museum complex, RAP commissioned Washington, D.C., artist Sam Gilliam to create a silk-screen serigraph poster celebrating the new facility. Proceeds from sales of the limited-edition serigraph will help support "Discover Graphics," the annual program for area art students and teachers.

Cooperation within the Institution

Program members meet regularly with the representatives of other Smithsonian bureaus and offices, as well as the Woodrow Wilson International Center for Scholars, to discuss concepts for new activities. From these collabora-



Roberta Peters at the Smithsonian in a stunning performance marking National Arts Week. (Photograph by Robert deMilt)

tions comes a rich variety of programs in history, the arts, and the sciences. In 1987, RAP cosponsored activities with all museums and many other units of the Smithsonian.

Several examples reveal the diversity of these cooperative undertakings. With the National Museum of American History, RAP organized four chamber music series. RAP and the Hirshhorn Museum and Sculpture Garden cosponsored the 20th Century Consort and three lectures—"An Evening with Nancy Graves," "Morris Louis: 25 Years Later," and "An Evening with Gene Siskel and Roger Brown." Two concerts and a lecture were developed to complement exhibitions at the Renwick Gallery, and a lecture by James Rosenquist enhanced an exhibition of the artist's work at the National Museum of American Art. A course jointly sponsored by the program and the National Portrait Gallery featured lectures by six noted American artists and authors.

At the National Air and Space Museum, cooperative endeavors included a lecture by U.S. Senator and former astronaut John Glenn and a presentation by Dick Rutan and Jeana Yeager, pilot and copilot of the *Voyager*, the only aircraft to circle the globe without refueling. A variety of activities is planned and carried out with the National Museum of Natural History, including lectures and courses for adults and classes and tours for children. Resident Associates' collaborations with the Smithsonian En-

vironmental Research Center in Edgewater, Maryland, resulted in several naturalist tours of the Chesapeake Bay and coastal forests. In addition, RAP and the Office of Horticulture organized several tours of the Enid A. Haupt Garden, and with the Arthur M. Sackler Gallery, a special viewing of the gallery's inaugural exhibitions was offered to Resident Associates.

RAP Director Janet Solinger continued to serve as senior adviser to the Kellogg Project of the Office of Museum Programs, and she spoke frequently at the office's workshops. Collaborations with the Museum Shops included special "shopping parties" for RAP members, as well as book-signing receptions following lectures.

Outreach

Through scholarships and special projects, RAP actively seeks to broaden the audience it serves, involving groups traditionally underrepresented in Smithsonian activities. The annual "Discover Graphics" program, for example, provides free etching and lithography training on Smithsonian presses for nearly two hundred talented art students and their teachers, all from Metropolitan Area public high schools. The program culminates with a juried exhibition of the students' prints at the National Museum of American History. In 1987, the Gene Davis Printmaking Studio, the new home of Discover Graphics, officially opened in the Arts and Industries Building.

Scholarships to Young Associate and adult courses were awarded, through the public school system, to sixty-one children and forty-nine adults who live in the inner city. Under the auspices of the Smithsonian Career Awareness Program, twenty inner-city youths served as teacher assistants at the Young Associate Summer Camp.

Programs designed to appeal to the older citizens, who are contacted through retirement centers and other organizations for senior citizens, include "Tuesday Mornings at the Smithsonian," a weekly lecture series, complete with continental breakfast. In 1987, twenty-eight lectures by Smithsonian scholars attracted sixty-eight hundred participants.

RAP continued its series of "Singles Evenings" at the Grand Salon of the Renwick Gallery. Widely publicized and widely emulated, the series featured lectures by Smithsonian scholars, followed by champagne and hors d'oeuvre receptions. More than thirty-five hundred people attended the series.

The annual Kite Festival was again successful. The twenty-first festival, open to members and the general

public, attracted twelve hundred participants and spectators to the Mall in March.

Outside Collaborations

Nearly eight thousand people learned about conservation and wildlife matters in the fourteenth annual lecture series cosponsored by RAP, the Audubon Naturalist Society of the Central Atlantic States, and the Friends of the National Zoo. In 1987, RAP collaborated with a variety of other organizations and institutions, with the aim of developing innovative educational programs. Collaborating organizations included the National Geographic Society; National Gallery of Art; Organization of American States; Filmfest, D.C.; Meridian House International; Washington, D.C., Chapter of the American Institute of Architects; Urban Land Institute; American Society of Interior Designers; American Architectural Foundation; St. Elizabeth's Hospital; Council for the Advancement and Support of Education; Washington Project for the Arts; Levine School of Music; and major museums in New York, Baltimore, Philadelphia, and Texas.

With AMTRAK and CSX, the program produced a very popular series of railroad tours, and *The New Yorker* magazine underwrote the enormously successful course "The Best of *The New Yorker*."

Foreign organizations that collaborated with RAP in 1987 included the Embassy of Argentina, for the film series "Emerging Argentine Cinema," and the Japan Information and Culture Center, for "Children's Day at the Embassy of Japan." The embassies of Turkey, Yugoslavia, and Brazil and the Office of the Commissioner for Hong Kong Commercial Affairs cosponsored RAP courses.

Programs

During the past year, RAP offered programs tailored to interests ranging from art to zoology at sites as varied as antebellum mansions, trains, and coastal marshes. Some courses focused on the ancient past, as revealed by archaeological research, while others contemplated the future of the universe, as deduced from the studies and theories of some of the nation's leading physicists and astrophysicists.

Courses. Over the four terms during the year, RAP offered more than two hundred lecture courses for adults. Attendance at single lectures in 1987 totaled more



A trophy-winning participant at the twenty-first annual Kite Festival on the mall, which attracted 1,200 persons. (Photograph by Jeff Tinsley)

than sixty-three thousand, a better than 10 percent increase over the previous year. "The Best of *The New Yorker*" and several other courses attracted especially large audiences. "Telling the Story: An Inside Look at How News Is Created" featured such noted media professionals as National Public Radio's Susan Stamberg and Daniel Zwerdling and *New York Times* health reporter Jane Brody. Also popular were "The Origins of the World: A Quest for Answers," with Smithsonian Secretary Adams as the final speaker; "Architecture for a New Century," saluting the one hundredth anniversary of the Washington, D.C., Chapter of the American Institute of Architects; and "Connoisseurship in the Visual Arts," taught by National Portrait Gallery Director Alan Fern, National Gallery of Art curator Arthur Wheelock, and Stuart Dennenburg, president of Dennenburg Fine Arts in San Francisco.

Studio Arts. Traditional and contemporary arts and crafts were examined in 250 courses and workshops, enhanced by studies of Smithsonian collections. Nearly sixteen thousand people took advantage of these offerings. The new, state-of-the-art photography laboratory and

studio arts rooms in the Ripley Center have enabled RAP to expand its curriculum to include color photography techniques and to add a variety of hands-on workshops and courses. Guest instructors in 1987 included Canadian wildlife artist Robert Bateman, New Zealand potter Barry Brickell, Japanese woodcut master Unichi Hiratsuka, and American woodturner Palmer Sharpless.

Lectures, Seminars, and Films. Single lectures, intensive one- and two-day seminars, and scholarly symposia—all featuring presentations by recognized authorities—addressed a wide range of current cultural and scientific topics. Several films made their United States or Washington debuts at RAP-sponsored showings.

Notable speakers who appeared at these activities in 1987 included artist Julian Schnabel, designer Mary McFadden, art collector Leonard Andrews, composer and jazz historian Gunther Schuller, filmmaker and naturalist Sir David Attenborough, novelists Nicholas Gage and Toni Morrison, Pulitzer Prize-winning poet Henry Taylor, legal scholar Archibald Cox, oceanographer Robert Ballard, physicist John Schwartz, and conservationist Russell Peterson.

A total of 31,400 people attended 126 lectures during 1987. Some 1,700 people participated in 14 all-day seminars, which included "Art of Biography," "Contemporary Life in a Chinese Village," "Maya Civilization: Lords of the Jungle," "The Constitution: Great Issues of Today and Tomorrow," and "Psychotherapy Today."

The fifty-five films shown in 1987 attracted an audience totaling fourteen thousand. The Washington premiere series "Cinema from the Soviet Republics" drew national acclaim and was attended by Elem Klimov, president of the Soviet Filmmakers Union; a delegation of Russian filmmakers; and Soviet Ambassador Yuri Dubinin. RAP also featured the American premieres of two Czech films—*A Thousand-Year-Old Bee* and *Forbidden Dreams*—and the Washington premiere of *The Mission*.

Performing Arts. In its fourth season of sponsoring ticketed events in the performing arts, RAP presented more than one hundred shows that were attended by twenty-eight thousand people. Highlights were performances by Metropolitan Opera soprano Roberta Peters, performer-musicologist Max Morath, the Leningrad Dixieland Jazz Band, cabaret singer Michael Feinstein, folk musician Doc Watson, and pianist-singer Shirley Horn. An outstanding jazz series saluted influential small ensembles and early big bands. The series was assembled and narrated by Martin Williams, jazz expert and special-projects editor at the Smithsonian Institution Press.

Women's Committee of the Smithsonian Associates

Study Tours. More than 18,300 people participated in the nearly six hundred tours organized by the program in 1987. Kept small to foster in-depth learning, RAP tour and field-study groups received first-hand experiences in the fields of art, architecture, archaeology, history, industry, and science. Activities included walking tours of Washington neighborhoods, visits to historical sites and private collections, and a three-day cruise on a clipper ship from Washington, D.C., to Annapolis, Maryland. Further afield, RAP members went on an overnight tour of art collections in the Texas cities of Dallas, Fort Worth, and Houston; others spent three days studying the architecture of Chicago, and a geology field trip to Shenandoah National Park included a campout. Tours commemorating the Bicentennial of the Constitution traveled to Philadelphia, the home and environs of James Madison, and the homes of noted Virginia antifederalists.

Young Associate and Family Activities. In 1987, RAP offered more than 150 workshops, classes, free films, performances, lectures, and other activities designed for young audiences—children between the ages of four and fifteen—and families. In all, more than twelve thousand children and parents participated. Those who attended the annual “Family Halloween Party,” held in the National Museum of American History, came disguised as their “favorite American.” Other annual events included a film and reception held in conjunction with the “Trees of Christmas” exhibition at the National Museum of American History, the “Evening Picnic at the Zoo,” the “Storytelling Festival,” and a family program during “Children’s Book Week.”

Discovery Theater. Live theater performances for young people and their families are presented each year from October through June. Nearly 67,000 people attended 234 performances during the past year; 85 percent of the total audience consisted of groups from area schools. In April, Discovery Theater produced an enthusiastically received original performance about the life and music of Duke Ellington. Complementing the city’s month-long celebration of the great musician and band leader, *Take the “A” Train* was partly funded by the *Washington Post*.

Volunteers. Nearly four hundred volunteers provided invaluable assistance to the program, monitoring activities and performing vital office tasks. The hours of work contributed by these volunteers were equivalent to that of nineteen full-time staff members. Office volunteers were honored for their contributions at a luncheon in April.

Celebrating its twentieth anniversary in November 1986, the Women’s Committee of the Smithsonian Associates continued to support the mission of the Institution through fund-raising, special project awards, and hospitality.

As part of its anniversary celebration, the Women’s Committee honored its founder, Mrs. S. Dillon Ripley, and first chairman, Mrs. Robert D. van Roijen, with twenty-year volunteer-service pins, the first awarded at the Smithsonian. The past year was also notable for the extensive contributions of the committee’s sixty-three active resource members, who gave a total of more than seven thousand hours to the Institution, and for the committee’s successful fund-raising efforts. Net proceeds from the committee-organized 1986 Christmas Dinner Dance and 1986 Washington Craft Show were used to support fifty-seven projects in twenty museums and bureaus. In all, the committee awarded \$162,000 in amounts ranging from \$500 to \$20,000.

The inherent variety of the Smithsonian was reflected in the projects funded by the Women’s Committee. A partial listing illustrates this diversity. Awards from the committee were used to support a new brochure and the “Family Day Program” celebrating the opening of the new Anacostia Museum; summer internships for college students at the Cooper-Hewitt Museum; an educational guide to the permanent collection of the Hirshhorn Museum and Sculpture Garden; a National Museum of African Art symposium on “Design and Color Symbolism in West African Strip-Woven Cloth”; the purchase of a portrait of Kahlil Gibran by Rose O’Neill for the National Portrait Gallery; and the creation of a biographical index of women artists represented in the collections of the National Museum of American Art.

The Women’s Committee also awarded grants for the recording and distribution of an educational cassette package on American Indian history and culture; the design and construction of exhibition facilities for the Stradivarius Quartet instruments; the purchase of a set of NASA news releases from 1958 to the present; support of a seminar on the care and organization of audiovisual collections; purchase of a sound recording of “Jump for Joy,” a 1941 revue with music by Duke Ellington; the duplication of documents detailing nineteenth-century British trading activities in the Isthmus of Panama; and the support of the video production *The Smithsonian Institution: Airplanes to Zoos*.

The National Museum of Natural History received funding for its “Living Ecosystem” exhibition, the cura-

tion of bird fossils from the Hawaiian Islands, and the purchase of two significant collections of flies and wasps. The National Zoological Park received grants to produce a video program on the Golden Lion Tamarin Conservation Project, to support doctoral students working on research to improve captive breeding, and to design and construct an exhibit on avian extinction. In addition, an award to the National Museum of American Art will create a special fellowship in honor of the late Adelyn Breeskin, a long-time Smithsonian curator and committee member.

In November, three committee members generously opened their homes to ninety Contributing Members, who were visiting Washington, D.C., for a special behind-the-scenes weekend at the Smithsonian. The sixteenth annual Christmas Dinner Dance, held in the National Museum of American History, enhanced the gala event's standing as a Smithsonian tradition and, again, was a tremendously successful fund-raiser.

One hundred artist craftspersons from twenty-eight states participated in the fifth annual Washington Craft Show, which is acknowledged as one of the best in the nation. In conjunction with the April show, a preview reception and silent auction were again organized to raise funds for the Smithsonian. In addition, renewed emphasis was placed on the High School Craft Competition. This portion of the show recognizes and encourages young artisans from local school districts and offers them contact with some of the country's finest craftspeople.

UNDER SEPARATE
BOARDS OF
TRUSTEES

John F. Kennedy Center for the Performing Arts

Roger L. Stevens, Chairman

The John F. Kennedy Center for the Performing Arts was conceived and serves as the national cultural center, a role that carries certain responsibilities. It operates every day of the year in the nation's capital and presents the finest music, dance, and theater. It gives American accomplishments in the performing arts the national recognition they deserve by bringing programs from all over the United States to its stages. It gives millions of Americans a chance to learn about and receive inspiration from live performing arts, both through its presentations and its nationwide education programs. The center also encourages young and lesser-known fine artists by giving them opportunities to perform at the center through national competitions to give them recognition.

To citizens and government leaders in this country, visitors from abroad, and members of the largest diplomatic community in the world, the center symbolizes our nation's regard for the performing arts and its dedication to the cultural enrichment of the United States.

Created by an act of Congress in 1958 as a self-sustaining bureau of the Smithsonian Institution, the Kennedy Center has two parts: It is the presidential memorial under the aegis of the Department of Interior, and it is a privately supported performing arts center directed by a board of trustees whose thirty citizen members are appointed by the President of the United States. Six congressional representatives and nine designated ex officio representatives of the executive branch complete the board membership. This annual report covers the activities and programming presented by the performing arts center, not only in its six theaters but also around the nation through its touring and education programs.

The Kennedy Center is specifically directed by its authorizing legislation to develop and present a broad array of performing arts programming—including theater, music, opera, ballet, dance, and educational and public service activities—in Washington, D.C., and across the country to provide the greatest public access. Since virtually no direct federal appropriations are provided for performing arts programming, fulfillment of this congressional mandate is made possible by earned income, primarily from ticket sales, and by the contributions of millions of dollars from the private sector. In 1987, earned income provided 71.2 percent of the center's total revenue, and government grants 7.1 percent. The Kennedy Center's future and long-range artistic programming are only partially secured financially through endowment funds. An ongoing campaign to increase this endowment began in 1985.

Two administrative milestones occurred during fiscal

year 1987. By the end of 1986, the Kennedy Center and the National Symphony Orchestra completed an administrative affiliation designed to help ensure the orchestra's long-range financial future and continued artistic excellence, while enhancing the Kennedy Center's national mandate; and in July 1987, Kennedy Center Chairman Roger L. Stevens and the board of trustees announced the appointment of Ralph P. Davidson as the center's president and chief executive officer, effective February 1988.

Performing Arts Programming

The 1986–87 season drew 1,340,007 people to performances in the Kennedy Center's Opera House, Concert Hall, Theater Lab, and Eisenhower and Terrace theaters. An additional 67,771 people attended free performances presented by the center through its Education Program, Holiday Festival, Cultural Diversity Festival, Friends of the Kennedy Center Open House, and other activities. Also, 68,000 people attended films presented by the American Film Institute (AFI) in the AFI Theater.

Several extraordinary events—in all areas of the performing arts—punctuated the center's season. Fall featured the world premiere of Gian Carlo Menotti's new opera, *Goya*, starring Plácido Domingo. In winter, the center presented the American premiere of the international hit musical *Les Misérables*. The all-star gala celebration of Mstislav Rostropovich's sixtieth birthday highlighted the spring, and in summer, the mighty Bolshoi Ballet returned to the Kennedy Center after an absence of more than a decade.

Drama and Musical Theater

Few theatrical events have been as eagerly anticipated and enthusiastically received as *Les Misérables*. Based on Victor Hugo's epic novel, the musical had its American premiere at the Opera House in December 1986, beginning an eight-week run that set a box-office record. The theater season opened and closed with musicals as well. *Queenie Pie*, the last theater work of the legendary Duke Ellington, launched the season, coming to the center fresh from its world premiere in Philadelphia. The season's dazzling finale was the twentieth-anniversary production of the Tony Award-winning *Cabaret*. In between, there were prominent revivals, including the American comedy classic *Arsenic and Old Lace*, Robert Anderson's moving *I Never Sang for My Father*, the



The students at the barricade scene from the American premiere of the International hit musical *Les Misérables*, at the Kennedy Center Opera House.

award-winning *A Raisin in the Sun*, and Gilbert and Sullivan's delightful *Mikado*.

The theater year also featured a variety of new works: the jazzy musical *Satchmo*, based on the life of Louis Armstrong; the riveting one-woman drama *My Gene*; the mystery *Sherlock's Last Case*; the poignant comedy *Opera Comique*; the Acting Company production of Mark Twain's *The Gilded Age*; and the powerful historical drama *Citizen Tom Paine*.

Also of note was a two-week engagement of the international hit *Tango Argentino*. A unique double bill presented George Gershwin's politically inspired *Of Thee I Sing* and *Let 'Em Eat Cake*. For the open-ended run of the comedy *Shear Madness*, the Theater Lab was transformed into a cabaret.

Among the outstanding performers who appeared on the Kennedy Center's stages during the 1986–87 season

were Colleen Dewhurst, Donal Donnelly, Jack Gilford, Harold Gould, Joel Grey, Anne Jackson, Larry Kert, Frank Langella, Terrence Mann, Larry Marshall, Dorothy McGuire, Esther Rolle, Marion Ross, Jean Stapleton, Richard Thomas, Daniel J. Travanti, Eli Wallach, and Colm Wilkinson.

Dance

The 1986–87 season saw the long-awaited, sold-out return engagement of the Bolshoi Ballet and the Washington debuts of the Pacific Northwest Ballet and the National Ballet of Canada.

Last appearing in Washington in 1976, the Bolshoi Ballet treated Kennedy Center audiences to two full-length works—*The Golden Age* and *Raymonda*—and to a daz-

zling program of divertissements. The National Ballet of Canada presented *The Merry Widow*, a full-length performance, as well as the city's premiere of Glen Tetley's *Alice*.

Appearing in the Opera House, Ballet West and the Pacific Northwest Ballet demonstrated the lively quality of dance in other regions of the nation. In the Eisenhower Theater, the Washington Ballet gave its first Kennedy Center performance. For its engagement, the American Ballet Theatre presented its sumptuous new production of *The Sleeping Beauty*. Other highlights included performances by the Joffrey Ballet, which presented Frederick Ashton's *La fille mal gardée* and six other Washington premieres, and a two-week engagement of the Dance Theatre of Harlem.

Dance America, jointly sponsored by the Kennedy Center and the Washington Performing Arts Society, complemented the ballet offerings by bringing to the center some of the country's most celebrated and influential modern-dance ensembles. Ethnic dance was represented in a spectacular way with the return of the Soviet Union's colorful Moiseyev Dance Company.

Music

In its first season as an affiliate of the Kennedy Center, the National Symphony Orchestra achieved several triumphs, including the memorable celebration of Music Director Mstislav Rostropovich's sixtieth birthday. The orchestra also recorded its concert performance of Musorgsky's *Boris Godunov*, performed at the week-long Casals Festival in San Juan, Puerto Rico, and held its annual series of concerts on the Capitol grounds.

An impressive lineup of international stars and promising young performers delighted audiences at the Terrace Concerts. In addition to piano and vocal recitals and performances by chamber ensembles and orchestras, the Terrace Theater hosted the International Series, the U.S. Information Agency's Artistic Ambassador Series, the Young Concert Artists Series, and Music from Marlboro—a three-evening program devoted to the music of American composer George Perle. Pianist Malcolm Frager, the Guarneri String Quartet, soprano Arleen Auger, and the Royal Swedish Chamber Orchestra were among the artists and performing groups appearing at the theater during the 1986–87 season.

The annual Kennedy Center Friedheim Award, designed to recognize and encourage the creation of new

American music, was awarded to Gunther Schuller for his String Quartet No. 3.

The Theater Chamber Players of the Kennedy Center, the Choral Arts Society of Washington, and Oratorio Society of Washington, and the Paul Hill Chorale returned to the center for their annual subscription concerts. And the popular Mostly Mozart Festival again offered a summer agenda of preconcert recitals and exquisite concerts featuring the Festival Orchestra and a host of premier soloists. Accenting this year's festivities were a colorful tent and preconcert supper.

Pop events were as numerous as ever, particularly during the summer, which featured performances by singer Tom Jones, the Chinese Dragon Acrobats, three young comics from television's "Saturday Night Live," and other entertainers.

The Kennedy Center's long-running Handel Festival came to a triumphant close after eleven consecutive seasons of concert operas, oratorios, and "best of" potpourris. Performances of *Joshua*, *Deidamia*, and Hallelujah Handel IV highlighted the finale of the series.

As always, the center offered a multitude of free events—many featuring performers from the Washington, D.C., area. Free performances were offered in conjunction with the Holiday Festival in December and with "Inside/Out," the center's third annual open house.

Kennedy Center Associate Organizations

The Kennedy Center's two artistic associates—the American Film Institute and the Washington Opera—produce many activities and programs for local audiences. During the past year, AFI presented classic and foreign films, independent features, and contemporary video works in its 224-seat theater. The Washington Opera scored an international coup this past season when it and the Kennedy Center produced the world premiere of Gian Carlo Menotti's latest work, *Goya*, which was subsequently televised by PBS.

In addition, the Washington Performing Arts Society presented a grand array of musicians and dancers from around the world in its diverse annual series.

Public Service Programming

As directed by Congress, the Kennedy Center carries out a broad range of educational and public service programs. These include the National Program for Cultural

Diversity, which encourages—through its sponsorship of performances, commissions, workshops, conferences, internships, and advisory and technical services in arts administration—artistic activities that reflect the nation's cultural and ethnic variety. With the exception of some financial aid from the U.S. Department of Education, these programs are supported by funds privately raised by the Kennedy Center. In 1987, \$2,321,000 was allocated from the center's private contributions to support national education programs and cultural-diversity activities and to subsidize theater, music, and dance presentations. These subsidies enabled the Kennedy Center to offer many free and low-price performances and events that were enjoyed by more than a million people in Washington, D.C., and around the country. In addition, 18,059 people visited and used the Performing Arts Library, which is a joint project of the Kennedy Center and the Library of Congress.

Education Programming

As the national cultural center, the Kennedy Center has responsibility for advancing all arts in the education of the nation's youth. Responding to this challenge, the center's Education Program sponsored performances and other events in 1987 that reached more than three million people nationwide. These activities were carried out through the Alliance for Arts Education, the American College Theater Festival, the National Symphony Orchestra Education Program, and Programs for Children and Youth. Each of these four components works closely with Very Special Arts, an educational affiliate of the Kennedy Center.

The Education Program, through its Program for Children and Youth (PCY), provided more than two hundred free performances and events to Kennedy Center audiences totaling more than sixty thousand in 1987. Reflecting its commitment to developing new works for young people, the center commissioned three new works in 1987, bringing the total since 1977 to twenty-eight. PCY also continued to offer performance opportunities to Washington-area youths through its Teen Acting Ensemble and Summer Drama Workshop. In addition, some 560 students, ages five through eighteen, received training in acting, puppetry, playwriting, and technical theater.

The Alliance for Arts Education (AAE) is a national network of forty-seven volunteer committees, based in states and special jurisdictions, that develops and promotes the arts in local school systems across the United



Leslie Carothers and Phillip Jerry in the Joffrey Ballet production of Gerald Arpino's *Light Rain* at the Kennedy Center.

States. In 1987, seven educators were awarded Kennedy Center Fellowships for Teachers of the Arts, and thirty-three principals and superintendents were cited for fostering the arts in their schools and school districts. AAE also sponsored the first phase of a major cultural exchange between the United States and Australia. Activities in the program, Arts Dialogue—Australia, are designed to commemorate the country's bicentennial in 1988. Nationwide, AAE welcomed the participation of about five hundred thousand young people, families, and teachers to Imagination Celebration festivals, which were held at thirty sites in twelve states, the District of Columbia, and two foreign nations.

For the nineteenth year, the American College Theater Festival (ACTF) combined the efforts of theater educators and professionals to recognize and celebrate the finest and most exciting works produced in university and college theater programs. In 1987, more than fifteen thou-

sand students and two thousand faculty members presented nearly seven hundred college theater productions representing almost five hundred schools. Victorious in local and regional competitions, five finalist productions were brought to the Kennedy Center for ACTF's national festival in April. Nationwide, productions entered in the 1987 festival drew audiences totaling one million people. The nineteenth festival also marked the first year of a three-year corporate gift to the program by the National Broadcasting Company. Also in 1987, ACTF cosponsored numerous awards programs in playwriting, design, criticism, acting, and theater administration.

As a result of the new affiliation between the National Symphony Orchestra (NSO) and the Kennedy Center, the Education Program was expanded to include NSO's educational activities. Since its beginning in 1931, the orchestra has presented specially designed concert programs to help further the music education of students and adults in the Washington metropolitan area. During the past year, the orchestra performed Young People's Concerts for more than forty thousand elementary school students. It also presented a "Meet the Orchestra" concert for high school students, Encore Concerts for Families, Young Soloists' Competitions for high school and college musicians, and numerous individualized programs for high school students interested in pursuing careers in music.

All components of the Education Program are supported by the Kennedy Center's Educational Services Division, which uses the center's performing arts resources as the basis for workshops and other educational activities designed for students, teachers, and the general public. More than twenty-two hundred teachers, some eighteen hundred other adults, and more than forty-three hundred high school students participated in these activities during the past year.

In 1987, the Education Program gave the Frances Holleman Breathitt Award for Excellence to Bob Keeshan ("Captain Kangaroo") for his contributions to the arts and to children. Rounding out its activities, the Education Program sponsored the International Children's Choir Festival, which brought to the center more than one hundred young choristers from Bangkok, Beijing, Hong Kong, and San Juan to promote world peace and goodwill through music.

Specially Priced Ticket Program

Since it opened in September 1971, the Kennedy Center has maintained a Specially Priced Ticket Program in con-

junction with performances produced and presented at the center. The largest of its kind in the nation, the program makes half-price tickets available to students, persons with permanent disability, senior citizens, low-income groups, and military personnel in grades E-1 through E-4. The attendant costs, in terms of administrative overhead and reduced revenue potential, are borne by the Kennedy Center. During the past year, combined sales of half-priced tickets to Kennedy Center and independent productions totaled \$75,907. The sale of these tickets at full value would have resulted in total additional gross income of \$1,131,913 to the center and independent producers.

Funding

The Kennedy Center is essentially a privately funded organization. It receives limited government funding for its programming. Presentation costs for nearly all its programs are such that the center depends on the financial assistance of individuals and corporate and foundation sponsors to make them feasible.

The National Park Service provides funding through annual appropriations to maintain and secure the building as a presidential memorial; the performing arts operation is charged its pro rata share, which totals more than \$1 million annually. Meanwhile, the Kennedy Center's board of trustees is wholly responsible for the cost of maintaining and improving the theaters, backstage, and office facilities at a cost of \$300,000 annually.

Artistic programming and day-to-day performing arts operations are almost entirely privately supported—with more than \$31.5 million in earned income and more than \$9.6 million in private sector fund-raising in 1987.

The nation's business community plays an important role in this effort through the Corporate Fund, established in 1977 by a group of national corporate leaders. Under the leadership of Corporate Fund Chairman Theodore F. Brophy, chairman of the GTE Corporation, the 1987 Corporate Fund contributed more than \$2.3 million from nearly three hundred businesses. The contribution supported the production of new or seldom-performed works, programs to develop new talent, development of musical theater productions, and other efforts.

In recent years, only 7 percent of the annual operating budget of the Kennedy Center and National Symphony Orchestra has come from government sources. Most of these funds have come from the U.S. Department of Education for the center's national education programs,

which are carried out at the request and with the approval of the department.

In 1985, the Kennedy Center launched a campaign to build a permanent endowment to help achieve the financial stability needed to sustain and increase the quality and variety of programming. As a result of the center's administrative affiliation with the National Symphony Orchestra, a joint campaign with a national goal of \$50 million is now under way to build an endowment for the two institutions. By September 1987, nearly \$18 million had been raised, bringing the total endowment to \$25 million. Included in this total is a \$1 million challenge grant for the center endowment from the National Endowment for the Arts. In addition, the center has received \$4.7 million in gifts for working capital to help support programming while the endowment grows.

The Kennedy Center Honors

The Kennedy Center Honors were first awarded by the board of trustees in 1978 to recognize the outstanding cultural contributions of the nation's finest performing artists. An annual event, the Honors Gala is the center's most important fund-raising benefit; the 1986 Honors Gala raised more than \$1 million in net proceeds to support programming. The Honors recipients were Lucille Ball, Ray Charles, Hume Cronyn and Jessica Tandy, Yehudi Menuhin, and Antony Tudor.

Friends of the Kennedy Center

The Friends of the Kennedy Center is a nationwide organization providing financial, administrative, volunteer, and community-relations assistance. Founded in 1966 to raise grass-roots support among private citizens for the construction of the national cultural center, the Friends organization counted more than thirty thousand donor members and more than seven hundred volunteers in 1987.

Revenues from the Friends' membership program, fund-raising events, and gift shops help support the overall operations of the center, as well as a number of national and community projects. For the last three years, the organization has sponsored "Inside/Out," an all-day festival of free performances and activities which, in 1987, drew more than fifty thousand people. Other public service programs receiving financial support from the Friends of the Kennedy Center included the Specially

Priced Ticket Program, the national 4-H program, the American College Theater Festival, and the Imagination Celebrations held around the country.

The organization's volunteers—whose total contribution of more than sixty thousand hours of free service in 1987 had an estimated value of about \$250,000—conducted free tours for more than two hundred thousand people, staffed the gift shops and information center, provided assistance to disabled visitors, and administered the Specially Priced Ticket Program.

The Friends of the Kennedy Center also administered the membership and activities of the National Symphony Orchestra Association and of the Friends Assisting the National Symphony (FANS), including the annual Radiothon and 10-kilometer run. Although the majority of the Friends of the Kennedy Center live in the Washington, D.C., area, the organization has members in all fifty states. In 1987, the first state chapter was established in Texas.

National Gallery of Art

J. Carter Brown, Director

The National Gallery of Art, although formally established as a bureau of the Smithsonian Institution, is an autonomous and separately administered organization. It is governed by its own board of trustees, the *ex officio* members of which are the Chief Justice of the United States, the Secretary of State, the Secretary of the Treasury, and the Secretary of the Smithsonian. Of the five general trustees, Franklin D. Murphy continued to serve as chairman of the board, and John R. Stevenson as the gallery's president. Also continuing on the board were Ruth Carter Stevenson and Robert H. Smith. In May, the general trustees accepted with regret Carlisle H. Humelsine's decision to retire from the board. Alexander M. Laughlin, of Tucker, Anthony and R. L. Day, Inc., in New York, was elected to fill the vacancy, and Mr. Humelsine was named trustee emeritus.

During the year, visitors entering the two gallery buildings totaled 6,986,465. Distinguished visitors included Foreign Minister Giulio Andreotti of Italy; Prime Minister Turgutozal of Turkey; Her Royal Highness Princess Alexandra of Great Britain; and President Mário Soares of Portugal.

Exhibitions

The year began with an exhibition of American furniture dating from the pre-Revolutionary period to the mid-nineteenth century. Featuring items from the collection of Linda and George M. Kaufman, the exhibition presented more than one hundred chairs, desks, tables, and high chests from the William and Mary, Queen Anne, Chippendale, Federal, and Empire periods, and it traced trends in the major regional style centers of Boston, New York, Philadelphia, Newport, and Charleston.

An exhibition of sculptures by Alexander Archipenko, a leading figure of the cubist movement, celebrated the one hundredth anniversary of his birth. Many of the works were representative of the artist's early career and revealed his wit and superb sense of color. Coinciding with the Washington Opera's world premiere performance of Gian Carlo Menotti's opera, *Goya*, the gallery supplemented its own major Goya collection with a selection of paintings and drawings from Spanish and American private collections.

"The Age of Sultan Süleyman the Magnificent" was the first major exhibition in the United States of treasures from the Golden Age of the Ottoman Empire and marked the first time in more than twenty years that Turkish art has traveled to this country. On display were

more than two hundred sixteenth-century objects, including illustrated manuscripts, drawings, paintings, textiles, inlaid wood pieces, ceramics, and imperial items made of precious metals and semiprecious stones studded with gemstones. Items for the exhibition were borrowed from the Topkapi Palace Museum's collection of Turkish national treasures in Istanbul and from private and public collections in the United States and Europe.

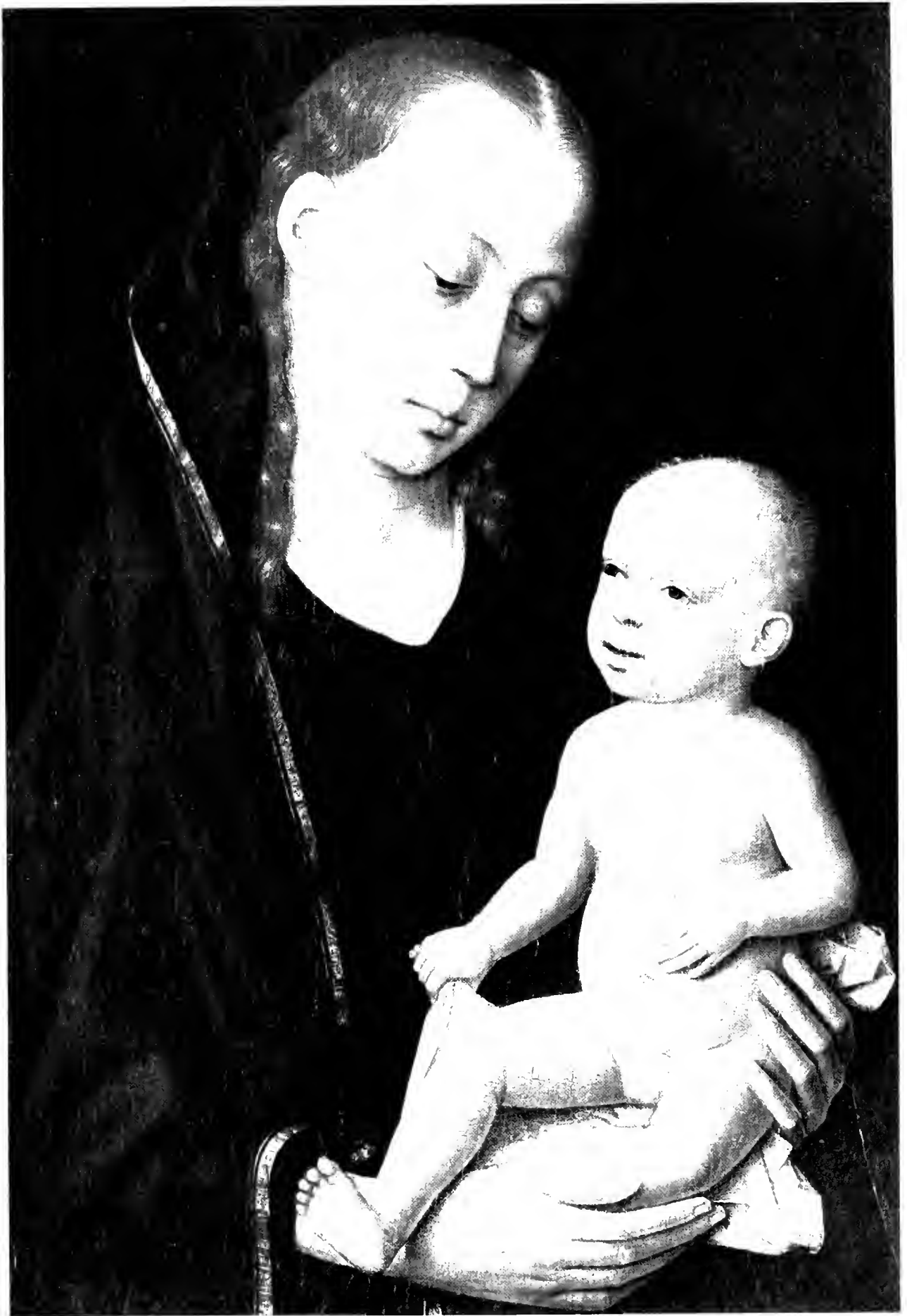
"The Age of Correggio and Carracci: Emilian Painting of the 16th and 17th Centuries" featured nearly two hundred paintings by fifty artists from the principal Italian artistic centers of Parma, Ferrara, and Bologna. The exhibition focused on the stylistic innovations of the Carraccis around 1600 in the context of the styles that preceded and followed these very influential painters in the Emilian region of Italy.

An exhibition of paintings by Henri Matisse was the first to be devoted exclusively to the artist's career between 1916 and 1930. During this span, Matisse lived in the south of France, lured by the intense light, brilliant colors, and exotic subject matter on the Cote d'Azur. Included were 169 works, almost one-third of which had seldom or never been on public view.

More than seventy modern sculptures from the collection of Patsy and Raymond Nasher were installed throughout the East Building's public spaces. These important additions highlighted concentrations of work by diverse modern masters of the figurative and constructivist traditions, as well as the minimal, pop, and post-modern movements.

"The Age of Bruegel," the first exhibition in the United States devoted solely to the sixteenth-century Dutch and Flemish drawings, consisted of more than one hundred works loaned by major museums and private collections in Europe and the United States. The works surveyed the wide range of styles and subject matter representative of the age, and they followed the development of the Netherlandish school from the influence of the late Gothic style to the assimilation of Italian Renaissance and mannerist styles. Another exhibition of works on paper brought more than sixty Italian old master drawings from the British Royal Collection, ranging from the Renaissance through the baroque periods. Among the works on view were seven drawings by Leonardo da Vinci, four by Michelangelo, and three by Raphael.

Madonna and Child by Dirck Bouts. Netherlandish, circa 1415/1420–1475. National Gallery of Art, Washington, D.C. Patron's Permanent Fund.



Twentieth-century American draftsmanship was examined in two concurrent exhibitions. "Selections from the Whitney Museum of American Art" traced major schools of American art, such as regionalism, early abstraction, and figurative modes from the traditional to the surreal. The exhibition focused on diversity and innovation in a wide range of subject matter and media, including graphite, watercolor, pastel, gouache, collage, and stamp-pad ink. The second exhibition probed realism in American art through drawings, watercolors, and temperas by Andrew Wyeth. The 140 works depicted the artist's neighbor, Helga Testorf, in Chadd's Ford, Pennsylvania. The exhibition offered a rare opportunity to follow a single artist's creative process, concentrating on and revising a single subject over a period of fifteen years.

The close of the year brought a major retrospective of the work of impressionist painter Berthe Morisot, which included many works that had not been seen by the public since the artist's memorial exhibition in 1896. In some sixty oil paintings, as well as a selection of pastels, watercolors, and colored-pencil drawings, the artist's virtuoso brushwork and extraordinary use of color were vividly demonstrated. A small but exquisite exhibition of a selection of some of the most beautiful works by American impressionist William Merritt Chase was shown concurrently with the Morisot show. Paintings done between 1891 and 1902 depicted Chase's family, summer home, and studio, and the many moods of the surrounding landscape at Shinnecock, Long Island. It was the first in a planned series of three closely focused exhibitions of masters and masterpieces of American impressionism.

Education Programs

According to the gallery's annual survey conducted during August, visitors from forty-eight states and fifty-four foreign countries stopped to make inquiries at the three information desks. These desks are staffed by more than ninety volunteers, who have been trained by members of the gallery's Education Department. To help them locate works of art and provide information about specific items, volunteers use the gallery's computer system.

Among the many diverse programs offered by the professional staff were three art history courses, consisting of four to eight slide lectures. One was a two-part survey of "The History of Western Art from Egypt to the Present," and the others—"Matisse: Master of Color" and "The Arts in Europe and the Near East at the Time of Süleyman the Magnificent"—provided background informa-

tion for two temporary exhibitions at the gallery. In addition, the gallery continued its very popular discussion groups, each session meeting at least four times to explore particular aspects of art history.

Five recorded tours of temporary exhibitions were offered to the public, as was an updated and revised "Director's tour" of the permanent collection in the West Building. Educational packets were prepared for area teachers, who used the classroom materials to prepare students for a visit to the Süleyman exhibition. During their visit to the gallery, students were treated to demonstrations by a calligrapher and illuminator of traditional Turkish styles and to a slide presentation on the design and installation of the exhibition. The gallery also offered family programs on Saturdays during the school year. The programs featured a storyteller, tours, films, concerts, and the ballet performance *After Miró*.

The gallery continued its successful series of Sunday afternoon lectures. The twenty-nine guest speakers during the past year included Sir Lawrence Gowing, the 1987 Kress Professor; H. Nichols B. Clark, director of the Lamont Gallery of the Phillips Exeter Academy; Wendy A. Cooper, director of The DeWitt Wallace Decorative Arts Gallery in Colonial Williamsburg; Richard S. Field, curator of prints, drawings, and photographs at the Yale University Art Gallery; Louise W. Mackie, curator in charge of the Textile Department of the Royal Ontario Museum; Terisio Pignatti, professor of art history at Wake Forest University; Jane Roberts, curator of the Royal Library Print Room in Windsor Castle; and Katharine Watson, director of the Bowdoin College Museum of Art.

The Extension Program's audience in the United States and sixty other countries increased to an estimated 180 million viewings of gallery-produced films, videotapes, and slide programs, exceeding the previous year's total by about ten million. Several gallery-produced films, such as the ones on Peto and Audubon, won awards in international film festivals in Italy, Belgium, Greece, Poland, and Czechoslovakia. The film *Winslow Homer: The Nature of the Artist*, produced by the Education Department in 1986, won a CINE Golden Eagle award and was aired throughout

Europe via the U.S. Information Agency's Worldnet.

The department continued to produce new slide programs, films, and videotapes that examined either the gallery's collections or its temporary exhibitions. One set of visual programs focused on the etchings by James McNeill Whistler in the collection, while two others focused on the life and art of George Inness and William Merritt Chase, whose works were displayed in temporary

exhibitions. In addition, a new videocassette explored the behind-the-scenes efforts that produced "The Treasure Houses of Britain," the gallery's major exhibition in 1986; another videocassette produced in 1987 examined the preparations for the past year's exhibition of works by Matisse.

The gallery's Film Program continued to expand, offering five feature-film series in 1987. In conjunction with the exhibition "Goya Paintings from Spanish Private Collections and the National Gallery of Art," the gallery presented the last eight films by the great Spanish filmmaker Luis Buñuel, and during the Matisse exhibition, avant-garde silent films made in France during the 1920s were shown. A seven-part series of Soviet films of the 1920s, organized by Center for Advanced Study in the Visual Arts senior fellow Annette Michelson, complemented the Archipenko exhibition. "Figures in a Landscape," a twelve-part film and lecture series, was organized to coincide with the exhibitions of American twentieth-century drawings and watercolors. Finally, a fourteen-film retrospective of the work of Italian filmmaker Luchino Visconti attracted nearly sixteen thousand viewers.

Two gallery-produced films—*Matisse in Nice* and *Süleyman the Magnificent*—were aired nationally by the Public Broadcasting System, and they are being distributed internationally in a videocassette format. *Süleyman the Magnificent*, coproduced with the Metropolitan Museum of Art and funded by the Turkish government and the Mobil Oil Corporation, was also sold to a London television station.

Acquisitions

Among the artworks purchased during the year were *Madonna and Child*, a small, but extremely rare, painting by fifteenth-century Netherlandish painter Dierck Bouts, and the brilliantly colored painting *God the Father* by seventeenth-century Italian artist Francesco Albani. *Sower*, a sculpture by Seymour Lipton, was purchased from the late artist's estate. Several eighteenth-century English and Italian works were secured for the graphics collection, including a watercolor landscape by Thomas Girtin and a tiny Guardi *capriccio*. A lovely Vuillard watercolor, *Four Ladies with Fancy Hats*, also was added to the collection. Among the prints purchased were two rare Constable etchings, both in first states, and three important woodcuts—a *Madonna and Child Enthroned* by an unknown fifteenth-century Augsburg printmaker, a

Baldung *Salome with the Head of John the Baptist*, and Christoffel Jegher's *Susanna Surprised by the Two Elders*.

On the ground floor of the West Building, a new gallery was opened to display Armand Hammer's collection of old master drawings, which is on permanent deposit in the gallery as a promised bequest. In addition, the new display includes the full-scale cartoon by Raphael for his painting *La Belle Jardinière*, the purchase of which was made possible by Dr. Hammer. Dr. Hammer also gave nine more drawings, including a Durer pen sketch, *The Centaur Family*, and a double-sided sheet of studies by Veronese.

Another exceptional gift to the Graphics Department's drawings collection was a small but exquisite group of old master and modern works given by Mrs. Lessing J. Rosenwald. The donated works included a red-chalk drawing of an old man by Rembrandt and an album by sixteenth-century Flemish artist Joris Hoefnagel of 277 watercolors of mammals, insects, reptiles, fish, and birds. The department's small collection of English drawings was enhanced by a gift of twenty-one late eighteenth- and early nineteenth-century works. A collection of works by John Marin—127 watercolors, drawings, and pastels, as well as sixteen sketchbooks and twenty etchings—was donated by the artist's son. The contemporary graphics collection was expanded with a gift of thirty-four prints and multiples published by Gemini G.E.L., including major works by Johns, Rauschenberg, Oldenburg, Kelly, Lichtenstein, and Borofsky.

Outstanding among the gifts of individual drawings were two early seventeenth-century works—a large Vinckboons drawing of an elegant garden party and a life-size *Head of a Siren* by Goltzius. Other notable gifts of drawings included a beautiful fifteenth-century Florentine study of St. John, a Poussin landscape sketch, a Vadder landscape, a Bellows nude, a Steinberg collage, and a large watercolor—*Field Hand*—by Andrew Wyeth.

Among the prints donated to the gallery in 1987 were five Kirchner lithographs, which included two of his finest color lithographs, *Russian Dancers* (1909) and *Three Bathers by Stones* (1913).

River Landscape with Cows, a major painting by seventeenth-century Dutch artist Aelbert Cuyp, also was received as a gift. In addition, the collection of twentieth-century American paintings was enhanced by a gift of two handsome portraits by Robert Henri of Mr. and Mrs. George Cotton Smith, a vibrant *New York, February, 1911* by George Bellows, and the gallery's first oil painting by John Marin, which was given by Mr. and Mrs. John Marin, Jr.

The year was also highlighted by the publication of *Early Netherlandish Painting*, the first volume of the scholarly systematic catalogue of the gallery's collections, a project begun five years ago. Another publication produced in 1987, *Summary Catalogue of European Paintings*, marked an important publishing milestone; the catalogue was typeset directly from the gallery's computerized art information data base. Begun in 1982, the data base now contains basic records for every object in the gallery's collections, as well as information on every artist represented there. In all, records for more than fifty-two thousand objects and more than eight thousand artists have been entered into the data base.

Temporary Exhibitions

"Gifts to the Nation: Selected Acquisitions from the Collection of Mr. and Mrs. Paul Mellon." Continued from the previous fiscal year to October 19, 1986. Coordinated by John Wilmerding and Charles F. Stuckey.

"Renaissance Master Bronzes from the Kunsthistorisches Museum, Vienna." Continued from the previous fiscal year to November 30, 1986. Coordinated by C. Douglas Lewis. Supported by Republic National Bank of New York and Banco Safra, S.A., Brazil, and the Federal Council on the Arts and the Humanities.

"American Furniture from the Kaufman Collection." October 12, 1986–April 19, 1987. Coordinated by John Wilmerding.

"Henri Matisse: The Early Years in Nice, 1916–1930." November 2, 1986–March 29, 1987. Coordinated by Jack Cowart. Supported by GTE Corporation and the Federal Council on the Arts and the Humanities.

"The Age of Bruegel: Netherlandish Drawings of the Sixteenth Century." November 7, 1986–January 18, 1987. Coordinated by John Hand. Supported by Shell Companies Foundation, Inc.; Unilever, United States, Inc.; and the Federal Council on the Arts and the Humanities.

"Goya Paintings from Spanish Private Collections and the National Gallery of Art." November 16, 1986–January 4, 1987. Coordinated by Charles F. Stuckey. Supported by Pacific Telesis Foundation and the Federal Council on the Arts and the Humanities.

"Alexander Archipenko: A Centennial Tribute." November 16, 1986–February 16, 1987. Coordinated by Jack Cowart. Supported by the Federal Council on the Arts and the Humanities.

"The Age of Correggio and the Carracci: Emilian Painting of the 16th and 17th Centuries." December 19, 1986–February 16, 1987. Coordinated by Sydney J. Freedberg. Supported by Montedison Group, Alitalia, and the Federal Council on the Arts and the Humanities.

"The Age of Sultan Süleyman the Magnificent." January 25–May 17, 1987. Coordinated by D. Dodge Thompson. Supported by Philip Morris Companies, Inc., and the Federal Council on the Arts and the Humanities.

"Italian Master Drawings from the British Royal Collection." May 10–July 26, 1987. Coordinated by Andrew Robison. Pan American World Airways was designated the official carrier of the exhibition.

"American Drawings and Watercolors of the Twentieth Century: Selections from the Whitney Museum of American Art." May 24–September 7, 1987. Coordinated by Ruth Fine. Supported by the Du Pont Company.

"American Drawings and Watercolors of the Twentieth Century: Andrew Wyeth, the Helga Pictures." May 24–September 27, 1987. Coordinated by John Wilmerding. Supported by the Du Pont Company.

"A Century of Modern Sculpture: Selections from the Patsy and Raymond Nasher Collection." June 28, 1987–January 3, 1988. Coordinated by Nan Rosenthal. Supported by Northern Telecom.

"William Merritt Chase: Summers at Shinnecock, 1891–1902." August 23–November 29, 1987. Coordinated by Nicolai Cikovsky, Jr. Supported by Bell Atlantic.

"Berthe Morisot." September 6–November 29, 1987. Coordinated by Charles F. Stuckey. Supported by Republic National Bank of New York and Banco Safra, S.A., Brazil; and the Federal Council on the Arts and the Humanities.

"*Repose*" (Portrait of Berthe Morisot by Eugene Manet). September 6–November 29, 1987.

Reading Is Fundamental, Inc.

Mrs. Elliot Richardson, Chairman
Ruth Graves, President

Marking its twenty-first year in 1987, Reading Is Fundamental, Inc. (RIF) began as a small pilot project in the nation's capital. The aim was to cultivate a love of reading among the young by making good books available to them. Over the past two decades, RIF has grown to encompass more than thirty-one hundred projects that serve 2.1 million young people in all fifty states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam.

Today, RIF boasts a volunteer network of some eighty-six thousand citizens whose grass-roots efforts continue to build literacy programs for young people. The sites of their efforts are not only schools and libraries, but also Indian reservations, housing projects, migrant-worker camps, hospitals, centers for the handicapped, juvenile detention centers, and day-care centers.

The results have been significant. Volunteers consistently report improvement in children's reading habits: Young participants are checking out more books from libraries and many have increased their reading comprehension; parents have become more involved in their children's education; and community support for reading programs has grown. These gauges of success are corroborated by recent studies of effective techniques to encourage reading, the results of which affirm the soundness of RIF's approach.

Both the public and private sectors share credit for these accomplishments. In 1987, the U.S. Department of Education again contracted with RIF to carry out the department's Inexpensive Book Distribution Program (IBDP), a program created by Congress in 1976 and modeled on the RIF approach. The federal program enables RIF to match local funds allocated for purchasing books.

At the local level, RIF projects are supported by some six thousand businesses and organizations that donate funds, goods, and services. Projects also receive substantial discounts on books as well as other services from some 350 publishers and distributors. In addition, over the last sixteen years, the broadcast and print media have contributed an estimated \$50 million worth of free advertising for RIF projects.

Since 1966, RIF's broad base of support has enabled the organization to distribute seventy-eight million books to young people.

1987 Highlights

RIF celebrated its twentieth anniversary in November with a gala party at the Washington, D.C., Convention Center. The festivities included a tribute to the organiza-



Two boys immersed in reading their new books distributed by Reading Is Fundamental, Inc. (Photograph by Rick Reinhard)

tion's longest-serving volunteers. The twenty people honored had contributed a combined total of more than 270 years of service. Mrs. George Bush, a member of the RIF board, presented each volunteer with a plaque commemorating his or her efforts.

The celebration also featured entertainment by "Sesame Street's" Kermit Love and his puppet "Snuggle the Bear," who performed for some four hundred Washington-area youngsters. Each of the young guests also received a free book and another to pass along to a needy friend.

At the Metropolitan Life Gallery in New York City, the winning posters in RIF's 1986 contest were exhibited along with a drawing contributed by Charles Schulz, creator of the famous "Peanuts" cartoon. Donated to RIF's annual "In Celebration of Reading" campaign, Schulz's drawing featured the "Peanuts" gang and a space for gallery visitors to write the titles of their favorite books.

Some four hundred thousand children participated in the second annual RIF poster contest, sponsored by Hallmark Cards, Inc. The winner, Dominic D'Aleo, of Blauvelt, New York, received a \$500 U.S. Savings Bond, books, prizes, and a trip for him and his family to Washington, D.C., during Reading Is Fun Week.

"In Celebration of Reading," sponsored by the Metro-

politan Life Foundation, again attracted hundreds of thousands of participants from around the nation. The campaign offers a variety of incentives to encourage young people to read during their leisure time. All youngsters who participate in the campaign are eligible for selection as local RIF Readers, who are then entered in a national drawing. In a ceremony held at the Martin Luther King, Jr., Library in Washington, D.C., Mrs. George Bush drew the name of Heather Bell, of St. Louis, Missouri, who became the National RIF Reader.

Since 1966, RIF projects have involved hundreds of thousands of parents in volunteer efforts to encourage children's reading. In 1984, RIF began to serve parents directly by initiating a Parent Services Program. Several foundations and corporations, including the General Electric Foundation, the John D. and Catherine T. MacArthur Foundation, and Beatrice, Inc., have provided strong financial support for the program. The General Electric Foundation, for example, has sponsored twenty-three parent workshops since 1984. These workshops feature nationally recognized speakers, small-group sessions led by reading experts, take-home advisory materials, and a book distribution for parents. During the past year, workshops were held in Hartford, Connecticut; Somersworth, New Hampshire; Boston, Massachusetts; Lansing, Michigan; Holmen, Wisconsin; and Poway, California.

In 1987, RIF received a second major grant from the John D. and Catherine T. MacArthur Foundation that enabled it to begin expanding its Parent Services Program to include publications for Spanish-speaking parents and to develop pilot literacy and reading projects to reach disadvantaged families.

During the last week of April, millions of children across the country celebrated Reading Is Fun Week with balloon launches, young author fetes, and parades featuring book characters. At the Washington, D.C., Armory, the Ringling Bros. and Barnum & Bailey Circus joined RIF in launching the national celebration. Complete with a clown performance of "Reading Is Three Rings of Fun," the circus program made the kickoff a memorable success for the audience, which included four hundred Washington-area youngsters. The spotlight, however, was on the National RIF Reader and the winner of the RIF poster contest, who were honored at the event.

A RIF Family Reading Fair, held in Washington, D.C., drew a large crowd of children and their parents. Hosted by the convention of the American Booksellers Association, the fair was sponsored by the Bantam/Doubleday/Dell Publishing Group. Several children's authors—Jill

Krementz, Tomie dePaola, Betsy Haynes, Lois Lowry, and Francine Pascal—were on hand to autograph books. The fair also featured games, reading crafts, storytellers, a dance historian, a riddle-maker, a puppet theater, and a country-western band. The activities ended with a RIF book distribution.

The annual Waldenbooks Golf and Tennis Tournament to benefit RIF was held once again at the Sleepy Hollow Country Club in Scarborough-on-Hudson, New York. The tournament attracted more than 200 publishing executives and other members of the book community, who paid to compete in the benefit event.

Mrs. Elliot Richardson, RIF chairman, was honored by WETA Broadcasting Company and the Library of Congress for her outstanding contribution to encourage reading and improve literacy among children. Mrs. Richardson was cited for her efforts at a ceremony held in the Children's Literature Center of the Library of Congress.

The Women's National Book Association (WNBA) named RIF President Ruth Graves winner of one of the WNBA Book Women Awards, the first given by the organization. On its seventieth anniversary, WNBA honored seventy outstanding women "who have made a difference in bringing authors and their readers together."

To mark RIF's twentieth anniversary, the Reader's Digest Foundation sponsored a RIF survey of public figures, celebrities, RIF volunteers, and youngsters, all of whom were asked to name their favorite books. The *Associated Press* ran an account of the replies received from President Reagan, cabinet members, and a host of politicians, columnists, entertainers, sports stars, writers, and artists. The widely circulated story helped bring national attention to RIF and its activities. The survey results were then published by RIF under the title *When We Were Young: Favorite Books of RIF Kids, RIF Volunteers, and Readers of Renown* to commemorate the Year of the Reader in 1987.

RIF also continued to publish materials designed to foster reading by youngsters. With grants from the Geraldine R. Dodge Foundation and the Xerox Company, RIF published three new "tips" brochures for parents. And in April, Doubleday and Company published *The RIF Guide to Encouraging Young Readers*, which is based on the organization's twenty years of experience and the contributions of thousands of volunteers, and describes more than two hundred activities for parents and children.

Woodrow Wilson International Center for Scholars

James H. Billington, Director*

The man who has the time, the discrimination, and the sagacity to collect and comprehend the principal facts and the man who must act upon them must draw near to one another and feel that they are engaged in a common enterprise.

Woodrow Wilson

The Woodrow Wilson International Center for Scholars was created in 1968 by special act of the U.S. Congress as a memorial to President Woodrow Wilson, "symbolizing and strengthening the fruitful relation between the world of learning and the world of public affairs." An independent entity in the Smithsonian Institution housed in the Castle building, the center is governed by its own presidentially appointed board of trustees and funded from both public and private sources.

During fiscal 1987, the Woodrow Wilson International Center for Scholars drew together eighty fellows; eighty-five guest scholars, research scholars, and short-term grantees; and 1,100 additional scholars, government policymakers, and leaders from corporate and professional life who joined the center's twenty-three major conferences of the year. Another 210 shorter conferences and formal meetings, many of which were open to the public, involved hundreds more participants in the substantive dialogues and discussions of the center. Fellows, selected by open international competition, spent four to twelve months at the center doing research on independent projects; other resident scholars undertook research for briefer periods. All contributed in various degrees to the center's almost daily agenda of discussions. Center research, whether a fellow's independent project or the result of a conference, proceeded under the auspices of one of the center's eight programs. These programs allow the center to organize an encyclopedic range of interdisciplinary research in the humanities and social sciences by world region—Asia, the Soviet Union, Eastern Europe, Western Europe, the United States, Latin America—or by transregional issues appropriate to the History, Culture, and Society program or the International Security program. In fiscal 1987, four programs combined the strengths of staff and fellows for three joint conferences, further integrating and enlarging the "common enter-

prise" of the center to advance knowledge, illuminate values, and improve choices in world leadership.

Outreach

Wilson Center fellowships and guest scholarships have accounted for at least 375 books since 1970. In 1986–87, thirty-three books were published as a result of center research, including *Military Withdrawal from Politics: A Comparative Study*, by Talukder Maniruzzaman; *Capitalism and Antislavery: British Mobilization in Comparative Perspective*, by Seymour Drescher; and *Beauty, Health, and Permanence: Environmental Politics in the United States: 1955–1985*, by Samuel P. Hays with Barbara D. Hays.

To this record, the center in recent years has added a successful category of conference volume publishing. These books are integrated, edited collections of original essays and papers of the center. In fiscal 1987, seven conference volumes were published: *The "Special Relationship": Anglo-American Relations since 1945*; *Strategic Defenses and Soviet-American Relations*; *Russia's American Colony*; *Spain in the 1980s*; *Superpower Competition and Security in the Third World*; *Security in the Middle East*; and *The Search for Peace and Unity in the Sudan*.

The center took several major steps forward in the 1986–87 year to match its growth in conference activity with appropriate resources for publication and dissemination of Wilson Center scholarship. In April the center appointed its first assistant director for publishing, Shaun Murphy. On June 3, The Wilson Center Press was established. On July 3, The Wilson Center published the first book to carry its imprint: *The Search for Peace and Unity in the Sudan*. Wilson Center Press publications are distributed in North America by UPA, Inc. Distribution outside North America is arranged on a title-by-title basis with foreign publishers considered most effective for translation and dissemination. By September 30, the publishing program had fifteen manuscripts in editing and production as hardcover and paperback books.

During this period, the center also developed an arrangement with Cambridge University Press for a Wilson Center Series. Approximately six books annually will be published by Cambridge under the joint colophon of The Wilson Center and Cambridge University Press. Thus, books of particularly strong international interest will be able to benefit from the most extensive distribution system currently available to books, reaching an estimated 154 countries.

*James H. Billington, director of the Wilson Center for fourteen years, departed the center in fiscal 1987 to become the thirteenth Librarian of Congress. Prosser Gifford, formerly deputy director of the center, was named acting director, effective August 1987, by the chairman of the center's board of trustees, William J. Baroody, Jr., until a new permanent director is appointed.

Two other actions strengthened the center's outreach strategy. The center purchased the Xerox Ventura desktop publishing system to develop newsletters, and opened discussions in May with the United States Information Agency for representation of Wilson Center books and periodicals in USIA exhibits worldwide. An active working relationship developed in the following months, with The Wilson Center providing publications for display at the Moscow Book Fair, September 8-14, and becoming a prominent participant in USIA's newly expanded and redesigned national exhibition at the Frankfurt International Book Fair, held immediately after the 1987 fiscal year, October 6-12.

In June 1987, the Smithsonian Institution Press published *Scholars' Guide to Washington, D.C., for Cartography and Remote Sensing Imagery*, the twelfth volume in the center's reference book series directing scholars to Washington, D.C., research resources.

The *Wilson Quarterly*, with paid circulation of more than 108,000, continued in its eleventh year to attract the largest number of subscribers of any scholarly journal in the nation.

Conferences and Meetings

Of the 233 conferences and meetings sponsored by the center in fiscal 1987, some deserve special mention.

Among the first conferences of the year was "Japan, Asia, and the Western Cultural Imagination," which explored Japanese cultural relations with other Asian nations and how these ties are perceived by Western scholars. Speakers included John W. Hall, emeritus professor of history at Yale University; Robert E. Ward, director of the Center for Research in International Studies at Stanford University; Albert Craig, professor of history at Harvard University; Marius B. Jansen, professor of history at Princeton University; Mark Peattie, professor of history at the University of Massachusetts, Boston; Ben-Ami Shillony, professor of history at the Hebrew University of Jerusalem; Thomas R. H. Havens, director of Asian Studies at Connecticut College; Ronald A. Morse, secretary of the Asia Program at the Wilson Center; and Daikichi Irokawa, professor of intellectual history at Tokyo University of Economics.

U.S. Secretary of State George Schultz was among the speakers at a three-day conference in November that commemorated the fortieth anniversary of the Fulbright scholar program. Entitled "Minds without Borders: Educational and Cultural Exchange in the Twentieth Cen-

tury," the conference was cosponsored by the Wilson Center, the U.S. Information Agency, the Board of Foreign Scholarships, and the Smithsonian Institution, which hosted a reception for participants at the National Air and Space Museum.

Another conference held in November, "The European Neutrals," focused on the dual challenge confronting Austria, Finland, Sweden, Ireland, and Switzerland: maintaining a credible armed neutrality in a complex strategic environment and upholding political neutrality when economic conditions require international collaboration. Speakers included Paavo Väyrynen, foreign minister of Finland; Rozanne Ridgway, U.S. assistant secretary of state for European and Canadian affairs; Gerald Hinteregger, secretary-general of the Austrian Foreign Ministry; and Edouard Brunner, state secretary of the Swiss Federal Department for Foreign Affairs.

China's purchases of U.S. technology have been increasing, and U.S. manufacturers are finding it easier to do business in the world's most populous nation, as lower-level Chinese enterprises exert more authority over their purchasing decisions. That consensus was one of several reached at an April conference on "Technology Transfer to China in Comparative Perspective." Speakers at the meeting were Otto Schnepf, professor of chemistry at the University of Southern California; Roy Grow, professor of political science at Carleton College; William Fischer, professor of operations management at the University of North Carolina, Chapel Hill; Martha Harris, senior analyst at the Office of Technology Assessment, U.S. Congress; Marshall Goldman, professor of economics at Wellesley College; and Denis Simon, assistant professor of management and technology at the Massachusetts Institute of Technology.

President Mário Soares of Portugal was one of the many participants in the center's four-day conference on "Portugal: Ancient Country, Young Democracy." Discussions at the May conference centered on the country's ongoing modernization and its broad cultural renaissance, as well as the broad range of views that characterize Portuguese politics. In addition to President Soares, speakers included Senator Claiborne Pell of Rhode Island; Congressman Tony Coelho of California; then-National Security Adviser Frank Carlucci; Vitor Constancio, secretary-general of the Socialist Party, Portugal; João Mota Amaral, president of the Regional Government of the Azores; and Alberto João Jardim, president of the Regional Government of Madeira.

At an October dinner meeting, Saburo Okita, former foreign minister of Japan and former Wilson Center fel-

low, focused on his country's international leadership strategy for the next decade. Other activities included the dinner discussion "Reflections on Russia and the Russians" (November), by George F. Kennan, former U.S. ambassador to the Soviet Union, and the evening dialogue on "Drugs in America: What Have We Learned from Old Battles? What Can We Do in Future Battles?" (January). Participants were David F. Musto, professor of psychiatry and history at Yale University; Daniel X. Freedman, professor of psychiatry and pharmacology at the University of California, Los Angeles; and Louis Dupré, professor of religious studies at Yale University.

The ambassadors of five South Asian nations to the United States engaged in the Wilson Center seminar on "New Dimensions of Regional Cooperation in South Asia" (February). The diplomat participants were A. Z. M. Obaidullah Khan, of the People's Republic of Bangladesh; B. K. Kaul, of India; Bishwa Pradhan, of Nepal; Jamsheed K. A. Marker, of Pakistan; and Susanta De Alwis, of the Democratic Socialist Republic of Sri Lanka. A few days later, attention shifted to West Germany, as Hildegard Hamm-Brücher, a member of the West German Bundestag, appraised the state of democracy in her country after four decades.

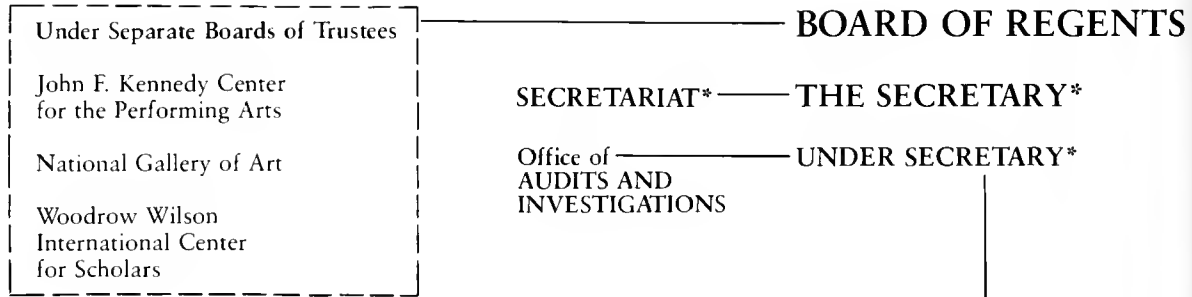
"American History: Black and White" (May) was the topic of an evening dialogue led by John Hope Franklin, emeritus professor of history at Duke University, and C. Vann Woodward, emeritus professor of history at Yale University. Marking the twentieth anniversary of the Association of Southeast Asian Nations (ASEAN), a Wilson Center gathering in May evaluated the future of regional cooperation in that area of the world. Participants included Phan Wannamethee, former secretary-general of the ASEAN Secretariat; Robert O. Tilman, professor of political science at North Carolina State University, Raleigh; and Donald K. Emmerson, director of the Asian Studies Center at the University of Wisconsin, Madison, and a former guest scholar at the center.

A dinner discussion examined "Lessons from the Fall and Rise of Nations: The Future of America" (June); among the participants were Paul M. Kennedy, professor of history at Yale University; Richard Rosecrance, pro-

fessor of international and comparative studies at Cornell University and then a Wilson Center fellow; Richard Lamm, former governor of Colorado; and Clyde Prestowitz, former counselor to the U.S. Secretary of Commerce and a former Wilson Center fellow. Smithsonian Institution Secretary Robert McC. Adams was joined by Beatrice Medicine, professor of anthropology at the University of Calgary, and Alphonso Ortiz, professor of anthropology at the University of New Mexico, to discuss "Sacred Objects: To Whom Do They Belong?" (June).

Fellows

The Wilson Center's fellows in fiscal 1987 came from countries all over the world, as well as from all regions of the United States. Fellows' research projects encompassed a wide array of questions in the spheres of scholarship and policymaking. Among the 1987 fellows were Marx W. Wartofsky, distinguished professor of philosophy at the City University of New York, who studied the genesis and development of human cognition; Rhys L. Isaac, LaTrobe University, Australia, who conducted research on the American Enlightenment; Miao Li, of the Institute of American Studies of the Chinese Academy of Social Sciences, who studied the role of the mass media in American society; Leslie Bethell, professor of Latin American history at the University of London and editor of the *Cambridge History of Latin America*, who examined events in Latin America during 1945 and 1946; José Manuel Donoso, writer from Santiago, Chile; Gabriel Gorodetsky, senior research fellow at Tel Aviv University, who concentrated on the origins of the Cold War; José P. Leviste, Jr., vice-chairman and secretary-general of the Pacific Futures Development Center, the Philippines; Richard Newton Rosecrance, Walter S. Carpenter Professor of International and Comparative Studies at Cornell University; Jadwiga Staniszkis, adjunct professor of sociology at the University of Warsaw; William Armistead Christian, Jr., writer, Las Palmas, Spain; and Timothy Garton Ash, foreign editor of the *Spectator*, London.



TREASURER*

- Business Management Office
 - Concessions
 - Mail Order Division
 - Office of Product Licensing
 - Smithsonian Museum Shops
- Office of Accounting and Financial Services
- Office of Financial Management and Planning
- Office of Risk Management

GENERAL COUNSEL*

Assistant Secretary for RESEARCH*

- Joseph Henry Papers
- National Zoological Park
- Office of American Studies
- Office of Fellowships and Grants
- Office of International Activities**
 - International Center
 - Office of Publications Exchange
 - Office of Service and Protocol
- International Environmental Science Program
- Smithsonian Astrophysical Observatory
- Smithsonian Environmental Research Center
- Smithsonian Institution Archives
- Smithsonian Institution Libraries
- Smithsonian Tropical Research Institute

Assistant Secretary for MUSEUMS*

- Anacostia Museum
- Archives of American Art
- Arthur M. Sackler Gallery and Freer Gallery of Art
- Conservation Analytical Laboratory
- Cooper-Hewitt Museum
- Hirshhorn Museum and Sculpture Garden
- National Air and Space Museum
- National Museum of African Art
- National Museum of American Art
 - Renwick Gallery
- National Museum of American History
- National Museum of Natural History / National Museum of Man
- National Portrait Gallery
- Office of Exhibits Central
- Office of Horticulture
- Office of Museum Programs
- Office of the Registrar
- Smithsonian Institution Traveling Exhibition Service

*Secretary's Management Committee.

** As of August 1, 1987.

INSTITUTION

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Smithsonian Magazine
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Office of Programming and Budget
Office of Special Events
Office of Supply Services
Travel Services Office

Cover: View of S. Dillon Ripley Center and
Enid A. Haupt Garden.
(Photograph by Nick Wheeler)

Frontispiece: Aerial view of the Enid A. Haupt Garden in
front of the Smithsonian Institution Building (the "Castle").
(Photograph by Jeff Tinsley)

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