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SMITHSONIAN INSTITUTION

Budget Justifications for Fiscal Year 1989



Submitted to the Committees on Appropriations
Congress of the United States

February 1988

SMITHSONIAN INSTITUTION

BOARD OF REGENTS

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 - Office of Accounting and Financial Services
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 - Office of Risk Management

- International Center
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- Development Office
- Smithsonian National Associate Program
- Smithsonian Resident Associate Program

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- Joseph Henry Papers
- National Zoological Park
- Office of American Studies
- Smithsonian Astrophysical Observatory
- Smithsonian Environmental Research Center
- Smithsonian Institution Archives
- Smithsonian Institution Libraries
- Smithsonian Tropical Research Institute

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- Archives of American Art
- Center for Asian Art
- Freer Gallery of Art
- Arthur M. Sackler Gallery
- Cooper-Hewitt Museum Laboratory
- Hirshhorn Museum and Sculpture Garden
- National Air and Space Museum
- National Museum Act
- National Museum of American Art
- Renwick Gallery
- National Museum of American History
- National Museum of Natural History/ Museum Support Center
- National Portrait Gallery
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- Office of Horticulture
- Office of Interpretive Programs
- Office of the Registrar
- Smithsonian Institution Traveling Exhibition Service

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- Office of Folklife Programs
- Office of Public Affairs
- Office of Special Education
- Smithsonian Symposia and Office of Telecommunications
- Smithsonian Institution Press
- Smithsonian Magazine
- Victorian Galleries
- Reception Center

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- Management Analysis Office
- Office of Congressional Liaison
- Office of Equal Opportunity
- Office of Information Services
- Office of Architectural History and Historic Preservation
- Office of Design and Construction
- Office of Plant Services
- Office of Security Services
- Office of Safety Programs
- Office of Information Resource Management
- Office of Personnel Administration
- Office of Training and Photographic Services
- Office of Programming and Budget
- Office of Special Events
- Office of Supply Services
- Travel Services Office

*Secretary's Management Committee

SMITHSONIAN INSTITUTION

FISCAL YEAR 1989 ESTIMATES OF APPROPRIATIONS

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SMITHSONIAN INSTITUTION
FY 1989 BUDGET REQUEST
(\$000's)

<u>APPROPRIATION</u> <u>ACCOUNT</u>	FY 1987 <u>APPROPRIATION</u>	FY 1988 <u>APPROPRIATION</u>	FY 1989 <u>REQUEST</u>
Salaries and Expenses	\$ 188,974	\$ 201,432	\$ 215,008
Instrumentation	-	-	1,206
Repair and Restoration	12,975	19,254	20,835
Construction	6,095	1,315	10,150
Zoo Construction	<u>2,500</u>	<u>8,150</u>	<u>5,305</u>
	\$ 210,544	\$ 230,151	\$ 252,504

INTRODUCTION

Centered on the Mall in Washington, D.C., the Smithsonian Institution operates major facilities and activities throughout the country and overseas. It is one of the world's leading research centers and encompasses the world's largest museum complex, attracting millions of visitors annually to its museums, galleries and zoological park. Many others also view Smithsonian traveling exhibitions, which appear across the United States and abroad, and the annual Folklife Festival. As custodian of the National Collections, the Smithsonian possesses more than 134 million art objects, natural history specimens and artifacts. These collections are displayed for the enjoyment and education of visitors and are available for research by the staff of the Institution and by hundreds of visiting students, scientists and historians each year. Other significant study efforts draw their data and results directly from terrestrial, marine and astrophysical observations at various Smithsonian installations.

The Smithsonian complex presently consists of 13 exhibition buildings on and near the Mall in Washington, D.C. and in New York City in the fields of science, history, technology and art; a zoological park in Washington, D.C. and an animal conservation and research center near Front Royal, Virginia; the Anacostia Museum, which performs research and exhibit activities in a low income area of the city in cooperation with the community; a preservation, storage and air and spacecraft display facility at Suitland, Maryland; two natural preserves, in Panama and on the Chesapeake Bay; an oceanographic research facility at Link Port, Florida; astrophysical stations in Massachusetts and Arizona; and supporting administrative, laboratory and storage areas.

FY 1989 BUDGET FORMULATION

The Smithsonian Institution's FY 1989 budget was developed following new internal budget formulation procedures. These new procedures were aimed at integrating and strengthening internal planning and budgeting processes and ultimately increasing the efficiency and effectiveness of management decisions. In large measure, the new processes are based upon a model followed by many public institutions of higher education, whose education, research and public service programs, governance and organization structure, and sources of funding are similar to those of the Smithsonian. The following paragraphs highlight the principal features of the process followed to set the Institution's FY 1989 planning and budget priorities.

First, in an effort to establish long-term programmatic goals in advance of budget formulation, bureau and office directors were asked to assemble and submit to members of the Secretary's Management Committee their plans and priorities for the next five years. These plans were submitted in early February, 1987, and during subsequent months each Management Committee member held extensive discussions with each bureau and office director to explore fully the issues raised. Based upon these discussions, areas of common interest and opportunities for collaborative efforts among the bureaus were identified on a preliminary basis, along with the potential research and administrative support requirements to accompany those new or expanded programs under contemplation. The identification and examination of the pan-Institutional consequences of individual bureau plans early in the planning process later contributed to improved coordination among bureaus as more refined program and budget plans were developed. After all of these discussions were held, the plans and priorities originally submitted by the bureaus and offices were either endorsed in concept, or indications were given that modifications were in order.

In a related and simultaneous effort, the Secretary and the Management Committee endeavored to amplify the Institution's basic mandate "to increase and diffuse knowledge." The intent was to develop an up-to-date, more explicit statement of purpose for the Institution and a set of related long-term goals. Much effort was directed at accurately articulating the essence of the Institution, its management philosophy, its aspirations for program quality and its heightened awareness of the need to reach a wider audience in more resourceful and sensitive ways. An integral part of this effort was also directed at determining an appropriate set of programmatic "areas of emphasis" representing the Institution's most important opportunities and requirements in the years ahead.

The "Statement of Purpose" and related long-term goals for the Institution appear in Exhibit 1, and the Secretary's "Areas of Emphasis" appear in Exhibit 2. These documents were endorsed by the Board of Regents at their meeting in May, 1987, and distributed to the bureaus and offices as the Secretary's formal guidance for budget formulation and further planning for the next five years. Bureaus were instructed to prepare budget plans that were responsive to and consistent with this guidance. After the bureaus submitted their budget plans for the next five years, these documents subsequently guided the establishment of the budget priorities embodied in the Institution's FY 1989 Federal budget request, in its FY 1988 and FY 1989 budgets for nonappropriated funds and in its Five-Year Prospectus, FY 1989-FY 1993.

EXHIBIT 1

SMITHSONIAN INSTITUTION

STATEMENT OF PURPOSE

The Smithsonian Institution was created by Act of Congress in 1846 to carry out the terms of the will of James Smithson of England, who bequeathed his entire estate in 1826 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."

Joseph Henry, the first Secretary, in his efforts to give purpose and direction to activities of the fledgling Institution, commented on Smithson's will in his annual report for 1864:

"He evidently did not intend by these precise terms to found a library or a mere museum for the diffusion of popular information to a limited community, but a cosmopolitan establishment, to increase the sum of human knowledge and to diffuse this to every part of the civilized world. No other interpretation of the will is either in accordance with the terms employed or with the character and habits of the founder. The increase of human knowledge, by which we must understand additions to its sum, would be of little value without its diffusion, and to limit the latter to one city, or even to one country, would be an invidious restriction of the term men."

Over the course of its 141-year history, and under the direction of succeeding Secretaries, the Institution has evolved into an eminent research center and the world's largest museum complex. Its activities span the globe and are devoted to research, museology, and public education in the arts, sciences, and history in the service of all mankind.

The Smithsonian is a unique establishment which is both publicly supported and privately endowed, and whose governance is vested in an independent Board of Regents composed of Federal officials, members of Congress, and private citizens. Donations from both the public and private sector increase its collections and continuing additions to its Trust funds expand and nourish the Institution's usefulness. Appropriations by Congress provide steadily increasing Federal support for the Smithsonian's far-reaching services to the public. Annually hundreds of thousands of service hours are provided to the Institution by dedicated volunteers.

EXHIBIT 1

SMITHSONIAN INSTITUTION

STATEMENT OF PURPOSE (Continued)

The research, management, care, exhibition, and security of its collections, the maintenance of its buildings, facilities, and natural areas and a program of selective acquisition for the collections are basic Institutional commitments. The Institution's holdings are a Trust responsibility and serve as important assets for future generations.

In addition to collections and non-collections related original research, museum curation, and collections management, the Smithsonian conducts a wide range of other programs in carrying out its broad goal of increasing and diffusing knowledge. It participates in joint ventures with other organizations in the United States and on every continent to study and understand subjects of world importance. Fundamental data are assembled for use by planners and research workers in other organizations, both government and private, national and international in scope. Historical and art studies, which enhance knowledge of man's cultural and technological growth, are also major endeavors. The results of the Institution's varied activities are disseminated to a wide audience through exhibitions, publications, and other public media programs.

Most important to fulfilling the basic purpose of its founding benefactor, the Institution places the highest priority on achieving quality in the conduct of its activities while making the most effective use of available resources.

GOALS

The Institution seeks to achieve its basic mission to increase and diffuse knowledge in the following ways:

- By providing the highest quality of research, curatorial, and professional leadership and expertise through emphasis on excellence in staff appointments and promotions, and through maintaining and improving technical assistance, fellowship programs, equipment, and facilities which support collections related and other original research.
- By promoting joint research, museum and education programs with other domestic and foreign academic and museum enterprises through a sharing of knowledge, expertise, exhibitions, collections, facilities, and other resources.
- By providing stimulating educational and museum experiences for all visitors, and by promoting outreach activities at many levels, especially those that will increase participation by minorities, handicapped persons, senior citizens, and other specialized groups.

EXHIBIT 1

SMITHSONIAN INSTITUTION

STATEMENT OF PURPOSE (Continued)

- For the sake of future generations of scholars and visitors, by careful attention to the acquisition, care, and preservation of collections and Institutional facilities that house them, especially as related to protection, inventory, storage, building maintenance, equipping activities, and renovation of exhibit and other public areas.
- By producing exhibitions using the Institution's and other collections and contemporary techniques to communicate to the Institution's audiences information about historical and cultural development, recent discoveries, new technologies, and new results of scholarship in science, history, and art.
- By producing quality magazines, books, periodicals, catalogues, journals, television and radio programs, and other educational products for the research and museum communities, and the general public.
- By providing a more complete understanding of programs and activities to the general public, foreign and domestic research and museum communities, and governmental organizations through the latest media and technical advances.
- By maintaining management, administrative, and support services to meet program needs, by providing internal financial systems and controls, and by periodic assessments and orderly planning for new and renovated facilities for purposes of accomplishing research, collections, and public related programs.

EXHIBIT 2

SMITHSONIAN INSTITUTION

AREAS OF EMPHASIS

Management Philosophy. Improve communications between central and bureau management; develop cooperative operations among bureaus with common interests; and critically evaluate all ongoing programs and support activities for purposes of discontinuing those that have outlived their usefulness, improving the quality of program products and delivery of services, and redirecting resources to more important efforts.

Research and Research Support: Collection and Non-Collection Based.

- Strengthen emphasis on excellence in staff promotions and appointments; progress with equal employment and affirmative action objectives.
- Strengthen joint programs and ties with other academic and museum enterprises, domestic and foreign, in areas of common interest.
- Increase bureau flexibility and responsibility for development of and response to new museum and research initiatives in art, history, and science areas.
- Provide for orderly forward planning and commitments for research instrumentation and facility development (Smithsonian Tropical Research Institute plan, Smithsonian Astrophysical Observatory Whipple base camp, Multiple Mirror Telescope conversion, submillimeter telescope, Zoological Research facility at Rock Creek).
- Strengthen and balance biological and biodiversity research and associated technical support (especially among such areas as taxonomy, systematics, molecular biology, species propagation, and other environmental studies).
- Enhance fellowship and internship programs.

Public Services. Strengthen visitor experiences and services based on researched demographics and needs; widen educational and museum outreach, specifically through exhibitions, program and membership initiatives directed toward minority audiences and development of new teaching materials and aids.

EXHIBIT 2

SMITHSONIAN INSTITUTION

AREAS OF EMPHASIS (Continued)

Facilities.

- Pursue correcting the backlog of deferred building maintenance, strengthening preventive maintenance programs, accelerating renovation of exhibition space, and continuing with initial equipping and outfitting of the Museum Support Center.
- Examine and pursue orderly scheduling and development of major renovations and new construction projects; develop an in-house facilities planning capability.

Collections Management. Continue to strengthen collections management and to identify associated requirements (storage, inventory, systems, conservation).

Administration. For the successful realization of Institutional program goals, pursue correction of operating and funding deficiencies in protection and plant services, safety and environmental programs and accounting, personnel, and procurement activities.

International and Associated Programs. Promote increased public awareness and understanding of other cultures; foster international scientific cooperation and exchange; continue with present scope and projected rate of growth of the Columbus Quincentenary program, but incorporating new and worthwhile projects, if necessary, and if they provide long-term and lasting foundations in strengthening international relations, particularly with Latin America.

General Development. Continue to examine and consider various realistic ways to increase basic Trust resources of the Institution, including product development, a general capital campaign, cultivation of donors, international markets, and alternative investments.

FY 1989 BUDGET HIGHLIGHTS

The Smithsonian Institution's FY 1989 budget request for all accounts totals \$252.5 million, or \$22.3 million more than the FY 1988 appropriation. The Institution's FY 1989 budget places increased emphasis on elevating the appropriation for the Repair and Restoration account to the level necessary to begin to eliminate the substantial backlog of deferred maintenance in its various facilities and to properly manage the expanded number of repair projects. Continued funding at a "current services" level for essential repair work would force the Institution to fall further behind with efforts to assure the continued operation of building equipment and systems, to provide long-term preservation of buildings or to bring buildings in compliance with life and health codes and standards. The remainder of the request for increased funds represents the funding required to support the Institution's various "Areas of Emphasis" for achieving its long-term programmatic goals and to cover various uncontrollable items of expense. Following are highlights of the FY 1989 budget request for each of the Institution's four appropriation accounts.

Salaries and Expenses

The Salaries and Expenses (S&E) request totals \$216.2 million and 4,276 work-years. This represents an increase of \$14.8 million and 184 workyears over the FY 1988 appropriation. Thirty-seven of these workyears are to annualize new positions authorized by Congress in FY 1988.

Included in the S&E request are additional funds totaling \$5.5 million to cover basic "uncontrollable" cost increases for necessary pay, rent, utilities, postage, and communications. The remainder of the S&E request would allow \$9.3 million of program growth, with \$1.3 million of this growth directly in support of the management of a much expanded facilities repair and restoration program. This \$9.3 million is distributed among the Secretary's various "Areas of Emphasis" shown in Exhibit 2 as follows:

<u>Area of Emphasis</u>	<u>Amount</u>
Research and Research Support	\$2,981,000
Public Services	434,000
Collections Management	1,598,000
International and Associated Programs	273,000
Administration	2,657,000
Facilities	<u>1,330,000</u>
TOTAL	\$9,273,000

The following paragraphs provide a profile of some of the major initiatives in the requested S&E budget for these various functional areas.

Research and Research Support--A major portion of the request for additional funding support for research is to enable the Astrophysical Observatory to continue efforts directed at the eventual construction of telescopes for use at submillimeter wavelengths and to continue the conversion of the Multiple Mirror Telescope to a single mirror telescope. It is particularly significant that the FY 1989 request also

reflects an indispensable change in the way the Smithsonian is now able to plan for the acquisition of such major scientific instrumentation through the S&E account.

The Institution has in the past purchased most needed research equipment as an operating expenditure through the S&E account. However, it became increasingly difficult to conduct orderly and cost-effective planning for the acquisition of major pieces of instrumentation that are more analogous to capital costs under the constraints of a one-year appropriation. Instruments such as telescopes require careful research and development (R&D) over an extended period by concentrated teams of in-house scientists and technicians for such critical sub-elements as optics, receivers and structural forms. In addition, the fabrication of these sub-elements, or necessary modifications to them, must be done largely in-house, or with specialized contractors, as opposed to being bought off-the-shelf.

The budget request for SAO's telescope initiatives therefore reflects the establishment, within S&E, of a sub-account for "Major Scientific Instrumentation" that will accommodate no-year appropriations for these R&D costs. The no-year provision will allow the flexibility that is so critical to the development of these telescopes and other leading-edge scientific tools. The development of such instruments involves, almost by definition, the unknown, since researchers are pushing back the frontiers of science and technology. As a result, certain sub-elements of a particular instrument may develop at different rates, for which such flexibility will be helpful.

The Smithsonian's initiatives for the further development of a submillimeter wavelength telescope array and for the conversion of the Multiple Mirror Telescope represent cutting edge scientific projects; both involve the fabrication of major new instrumentation that will take a number of years to plan, design and complete. The development of the submillimeter array could not be completed before the mid-1990's and will require total funding currently estimated at \$30 million. Similarly, the conversion of the MMT, which might be completed as early as 1992, will require estimated funding of \$10 million during the intervening years.

Also included in the request for "Research and Research Support" is additional funding for the National Air and Space Museum to intensify efforts relating to historical research in aeronautics. The additional staff requested will be instrumental in improving productivity in this field of research through the publication of books by academic presses and articles in peer review journals.

In addition, funds are requested for the National Museum of Natural History to expand its research program in biological diversity to proceed with the inventorying of species. The requested increase will enable additional field work and collaboration with other institutions. Additional funding is also requested to enable the Natural History Museum to establish a permanent sustainable capability for research in the rapidly developing field of molecular systematics, building upon the Museum's broad expertise in systematic biology encompassing both historical and ecological perspectives. Other requested research funds will allow the National Zoological Park to complete its development of the molecular systematics and evolution program through the establishment of a genetics laboratory.

Public Services--Other components of the FY 1989 budget request are directed at providing better programs and services to the public. Additional funds are requested for the renovation and reinstallation of exhibits at the National Museum of American History and at the National Museum of Natural History. Funds for the American History

Museum will enable the reinstallation of major permanent exhibits throughout its three floors of exhibition space. Additional funds for the Natural History Museum will enable it to embark on a long-term renovation plan for its 30 permanent halls.

In addition, funds are requested for the American Indian programs at the American History and Natural History Museums. Through cooperative programs offered by these bureaus, improved access to American Indian collections will be made available and new links will be forged with Indian communities.

Finally, additional funding is requested to enable the National Science Resources Center (NSRC) to establish a teaching resource collection and information data base of science and mathematics teaching materials. The NSRC is serving the Nation's schools by promoting collaborative activities with science museums, professional and scientific organizations, and scientists from universities and industry to develop new learning materials to strengthen mathematics and science education.

Collections Management--Collections management is a priority to which the Institution is seriously committed. Additional funding is requested for the Museum of Natural History for support staff to process backlogs and new incoming material, maintain collections accountability, and evaluate and cull collections. In addition, funds are requested to allow the Museum of American History to convert data to the Institution's collection information system, which supports data essential for management of collections for research, exhibit planning and object interpretation. These two museums have problems of the largest magnitude. Other requested funds will support additional staff--conservators, registrars and computer specialists--as well as storage space and equipment. A significant amount of the request is for additional collections storage equipment for the expanded and renovated areas at the Freer Gallery of Art. In some cases, the requested funding will provide professional assistance in collections management for the first time (i.e., at the Archives of American Art and the Anacostia Museum).

International and Associated Programs--To continue to plan and prepare exhibitions and events to commemorate the Bicentennial of the Constitution and the Columbus Quincentenary, additional funds are requested for several museums and offices to continue efforts begun in FY 1987 and for new starts in FY 1989. Among these are the Museum of Natural History, Museum of American History, the Air and Space Museum, Museum of American Art, Cooper-Hewitt Museum, Traveling Exhibition Service, Office of Elementary and Secondary Education, and the Office of Folklife Programs.

Administration--Among the most urgent of administrative needs are additional funds for the Office of Environmental Management and Safety to continue to improve environmental and safety programs. Equally important is the need for additional staff to maintain, operate and protect the General Post Office Building. Additional security staff are also required to accommodate requirements based upon final design of gallery space in the Quadrangle. These administrative requirements are in a sense uncontrollable, since the Institution has an obligation to provide for the safety of visitors, employees and the National Collections. Other funds are requested to implement the last phase of the Institution's new payroll/personnel system, which became operational in October, 1987 through the U. S. Department of Agriculture's Finance Center in New Orleans. Additional funding is also requested to allow the development of subsystems for the Institution's planned new financial information system, whose planning costs have thus far been supported by nonappropriated funds.

Facilities--A significant portion of the S&E request corresponds to the Institution's expanded program for facilities repair and restoration. The Institution has estimated that the current backlog of deferred repairs and other imminent major restorations totals \$216 million, and in all likelihood this figure will increase as additional facilities inspections are conducted. In acknowledgement of this need, the Congress provided a substantial increase in the Institution's funding for the Restoration and Renovation account between FY 1987 and FY 1988. The Institution is seeking a further expansion to this program in FY 1989. However, the expanded workload associated with this level of repair work is beyond the capability of existing staff. The Institution is therefore requesting additional funds to staff the various administrative offices that are impacted by the expanded facilities repair program.

Repair and Restoration

The Smithsonian Institution is requesting \$20.8 million in its newly restructured Repair and Restoration (R&R) account. First, \$3,700,000 is requested for the initiation of a Major Capital Renewal program to replace major building systems that are approaching the end of their useful lives at several of the Institution's facilities. In addition, \$17,135,000 is requested for Repair, Restoration and Code Compliance projects. Amounts requested in these two subaccounts will allow the Smithsonian to begin major restoration work and to reduce the backlog of deferred maintenance projects that have accumulated in recent years as the result of inadequate levels of funding. As cited above, inspections of the Institution's various facilities thus far completed, indicate that the cost of required repair and restoration work totals approximately \$216 million.

Construction

In the Construction account, a total of \$10,150,000 is requested to enhance the Institution's planning capability for future new facility or space requirements, including the renovations necessary to make the Old General Post Office Building usable (\$1,000,000), to design and construct laboratory and research facilities for the Tropical Research Institute (\$2,750,000), and to complete the construction of the base camp supporting the Whipple Observatory at Mount Hopkins, Arizona (\$3,200,000). Funds totaling \$3,200,000 are also requested for Alterations and Modifications to facilities. Included in this category are projects that in previous budgets were funded under the Restoration and Renovation. These projects, although small in scale compared to most new construction, are driven by changing programmatic needs rather than repair or preservation considerations.

Construction and Improvements, National Zoological Park

The request for the Construction and Improvements, National Zoological Park account is \$5,305,000. This amount includes \$1,555,000 for the highest priority repair and renovation projects at Rock Creek Park and \$550,000 for the highest priority projects at Front Royal. The remaining \$3,200,000 requested is to begin the modifications necessary to convert the Polar Bear Exhibit to an Amazonia Exhibit by enclosing the facility with the required mechanical systems to support a greenhouse type structure.

MANAGEMENT IMPROVEMENT ACTIVITIES

Presidential budget documents have included a report on his management improvement program. Although the Smithsonian Institution is not an executive agency and therefore not a formal participant in the President's program, the following comparison of the President's and the Smithsonian's management improvement initiatives demonstrates the Institution's commitment to increasing the efficiency and effectiveness of its operations.

Credit Management

The President proposes to achieve a major reduction in amounts owed the Federal government by using proven private sector debt collection techniques, offsetting delinquent debt against income tax refunds and Federal employee salaries and referring cases to the Justice Department for litigation.

Debt collection from outside persons or businesses has not been a significant problem at the Institution. In the spirit of the President's goal, actions have been put in place to reduce the level of outstanding travel advances to Smithsonian Institution employees which constitute interest-free loans to them. Over the past two years the level of such advances has been reduced from \$597,350 (1,722 items; 12 percent under 30 days) to \$368,615 (688 items; 40 percent under 30 days).

Financial Management

Stressed in the President's report are consolidation of agency accounting systems, adoption of other agencies systems, or buying off-the-shelf software.

A major Smithsonian effort in this area, coordinated by the Office of Financial Management and Planning, has been to define the full range of requirements for a financial information system that will meet the needs of a decentralized organization with centralized support operations, a variety of funding sources and a high volume procurement/payment process and at the same time allow for better access to and communication of financial information throughout the Institution. Several Federal and commercial systems are being reviewed with the goal of selecting a system soon.

A new automated budget process, which is also integrated with the planning process, has been initiated by the Office of Programming and Budget. This has led to increased efficiency in assembling all of the organizational components of the budget submissions to OMB and the Congress, increased access to greater amounts of program and financial information for more effective decision making and a strengthened relationship between the short and long term planning processes. Eventually, this automated budget and planning system can be integrated with the aforementioned financial information system, once it is implemented.

The crossover from the Honeywell mainframe computer to the IBM 4381 will provide access to a wider range of off-the-shelf software packages, reduce the need to design more costly customized software, and thus save programming resources.

The Smithsonian Institution's internal controls program, contained in Office Memorandum 823, embodies the principles outlined in Office of Management and Budget Circular A-123, with an Internal Controls Steering committee established in 1983 to oversee a formal internal controls and review effort to be conducted on a cyclical basis. The monitoring and reporting processes are performed for the Committee by the Management Analysis Office, assisted by the Office of Audits and Investigations. Computer security and timeliness of payments have been identified as the two priority areas requiring improvement.

Productivity Improvement

The President's program stresses productivity improvement aimed primarily at improving delivery of services to the public. The Institution has expanded the thrust of this effort to include various internal operations.

The recent transfer of the personnel/payroll system to the National Finance Center in New Orleans is expected to improve the Institution's ability to maintain and retrieve quality data, and process personnel actions more expeditiously. As additional phases of the new system are implemented, many functions which are currently done manually, will be automated allowing staff to devote attention to other tasks leading to greater system efficiency.

Another initiative undertaken by the Office of Personnel Administration is the 24-hour recorded personnel information hotline for handling routine calls. This system gives answers and information for the most current personnel problems, e.g., the new Federal Employees Retirement Plan, the Thrift Savings Plan, snow closings, etc. The use of recorded information frees staff from answering many routine calls and provides standard information on key issues. Office automation and bar coding of the official personnel files have lessened the typing load, provided better access control to files, and improved the ability to track file room activity.

The new Staff Bulletin, prepared by the Management Analysis Office, consolidates various types of information that are of interest to the general staff, and, in most cases eliminates the need to apply diffuse staff time and resource costs to producing announcements of Institution-wide interest. The Bulletin also provides for regular issuance of information which promotes strengthened communication ties throughout the Institution.

Procurement Management

The Administration's procurement reform agenda includes the enactment of the Competition in Contracting Act (CICA) to address the need for increased competition in government contracting and the issuance of the Federal Acquisition Regulation (FAR) which simplifies the regulatory process. The intended results are improvements in the procurement process -- including the acquisition of more commercial products; shortening the lines of procurement authority and responsibility; and improving the overall quality of the Federal procurement workforce.

The Smithsonian has complied with the CICA, which has reduced the number of sole source contracts awarded by the Institution. Rapid and comprehensive adoption of the FAR, through extensive outside and in-house training and revision of clause manuals

and all contractual documents, has allowed implementation to take place with a minimum of disruption and post-award problems.

In addition, a Procurement Executive (Director of the Office of Procurement and Property Management) has been appointed to ensure implementation of the policy directives of the Office of Federal Procurement Policy (OFPP) and coordinate the planning and scheduling of all high dollar procurements.

A major initiative from the Procurement and Accounting Offices was a simplified purchasing system for small purchases (under \$1,000) that provides more flexibility and responsiveness for the purchasing unit in the acquisition of normally commercially available products and services. This new system also has streamlined the internal requisitioning process by eliminating extraneous small purchases from the centralized procurement pipeline, improving cash management, and expediting the payment process. Complete documentation and audit trails are maintained.

The Procurement Office is scheduled to begin implementation of its plan to automate the bulk of the acquisition management process. This will encompass development of a management information system to track the volume, flow and status of requisitions as they develop into contracts. The result will be better on-line control of budget expenditures and establishment of an instant and continuous record of resultant additions, deletions and changes to the property management system records.

Other reforms include issuing formal and documented delegations of authority, publishing updated handbooks which delineate the proper flow of documentation, and carefully monitoring staffing and career development to ensure that contracts staff have the most current training and techniques available in the field.

Privatization

In his management message, the President points out that the Federal government often provides services that are available from the private sector at less cost and with better quality, and that he proposes to eliminate such inefficient Federal practices wherever possible.

As outlined in OMB Circular A-76, the requirement for agencies to rely upon commercial sources to supply needed products and services is observed by the Institution. Each year the Management Analysis Office does two studies of Smithsonian activities to assess the potential for continued internal operation or provision by contract of services which seem to lend themselves to a contract arrangement. So far, these studies have covered grounds maintenance and elevator and escalator maintenance, building custodial services and Office of Exhibits Central activities are under review this year.

The Office of Personnel Administration has contracted out all processing of Unemployment Compensation claims. This annual contract of \$11,000 has saved the Institution the cost of four staff members who would be necessary to handle the same services.

Exhibit 3 on the following pages summarizes the Smithsonian's various management improvement activities.

EXHIBIT 3

SMITHSONIAN INSTITUTION
MAJOR MANAGEMENT IMPROVEMENT INITIATIVES

<u>AREA OF IMPROVEMENT</u>	<u>UNIT</u>	<u>DESIRED RESULT</u>
<u>Credit Management</u>		
Reduction of outstanding travel advances	OAFS	Better management of cash
<u>Financial Management</u>		
Financial information system	OFM&P	Upgrade accounting and budgeting systems and provide better access to financial information.
Automated budget process	OPB	Improved efficiency and timeliness
Change in computer mainframe	OIRM	Savings in programming resources
Internal Controls Steering Committee	MAO	Oversight of progress in weak areas where recommended changes have been made
<u>Productivity Improvement</u>		
New payroll/personnel system	OPersA	Better quality data and faster processing
Recorded personnel information	OPersA	Free staff from answering routine calls; assure standard answers
Bar coding of official personnel files	OPersA	Improve ability to track activity in file room and provide better access control
<u>Procurement Improvement</u>		
Appointment of Procurement Executive	OPPM	Better planning and scheduling of high dollar procurements
Simplified small purchasing system	OPPM	More flexibility and responsiveness for purchasing unit
Automation of acquisition management process	OPPM	Better flow of information; on-line control of budget expenditures; improved property management system records

EXHIBIT 3

SMITHSONIAN INSTITUTION
MAJOR MANAGEMENT IMPROVEMENT INITIATIVES

<u>AREA OF IMPROVEMENT</u>	<u>UNIT</u>	<u>DESIRED RESULT</u>
<u>Privatization</u>		
Contract unemployment insurance processing	OPersA	Substantial savings and less need for staff
Contracting out studies	MAO	Cost/benefit analyses of various services; will allow for savings where possible

NONAPPROPRIATED SOURCES OF FUNDING

In addition to the support provided by Federal appropriations, the Institution also receives nonappropriated funds to expand and enrich its programs. Nonappropriated fund activities (Trust funds) are presented along with the Federal budget request to provide an overview of all uses of funds for each Smithsonian bureau. It must be emphasized that the estimates for Trust funds are subject to the uncertainty of donations, grants and contracts to the Institution, fluctuations in visitor attendance and the volatility of the economy, which affects restaurant, mail order and shop revenues, Associates' memberships and other auxiliary activities. The Institution's gross operating revenue, less the expenses of the auxiliary activities, represents the net operating revenue available for programmatic and other worthwhile purposes.

The FY 1988 Trust budget comprises approximately 26 percent of net operating revenues. Included in the above are grants and contracts received from government agencies. These are expected to total nearly \$18 million in FY 1988. Gross Trust fund revenues, excluding government grants and contracts, are expected to continue to grow and reach \$200 million in FY 1988. Net income, however, is projected in the \$54 million to \$56 million range (of which \$19 million is projected for restricted purposes).

The Trust funds are comprised of unrestricted funds, restricted funds and government grants and contracts and are applied in the following manner:

Unrestricted Funds

General - General unrestricted funds are generated from: short-term investment income; unrestricted endowment income; net proceeds from museum shops and food service concessions; sales of Smithsonian books, records and other products based on designs and objects in the collections; and the Resident Associate and National Associate Programs (including the Smithsonian and Air and Space magazines). Central management and administrative service units of the Institution, such as legal counsel, accounting, personnel, procurement and budget, receive Trust allotments from the General fund. These administrative costs are primarily funded from overhead recovery on grants and contracts received by the Smithsonian and from internal administrative fees charged to other Trust funded activities. General funds are also provided to various activities, such as the Visitor Information and Associates' Reception Center, the Cooper-Hewitt Museum, Smithsonian Tropical Research Institute, Office of Telecommunications and the Office of Folklife Programs, along with a variety of program allotments for important Institutional and bureau needs that are approved by the Board of Regents.

Special Purpose - These funds are generated by income-producing activities operated by the various bureaus and offices, the largest of which are the Theater and Spacearium operations of the National Air and Space Museum. Special Purpose funds also include: miscellaneous bureau revenues from the sale of posters, exhibit brochures and publications; tuition reimbursement from universities; the museums' share of sales in the restaurant and museum shops; membership and admission fees; exhibit rental income; and investment income from current fund balances.

Beginning in FY 1979, the Board of Regents approved transferring General funds to Special Purpose funds for certain programs previously financed with appropriated funds. These include the Institution's various fellowship programs (FY 1988 allotment of \$2.7 million) and the appropriate Trust fund share of rental costs of

administrative units in L'Enfant Plaza, funded in part from rental payments by auxiliary activities occupying space on the Mall. Special Purpose funds are also created by transfers from the General fund for awards from the Institution's Collections Acquisition, Scholarly Studies and Educational Outreach Program. Of the \$4.7 million approved for FY 1988, an amount of \$1.7 million is available for purchase of outstanding objects of importance to the collections. In FY 1986, the Sackler Gallery purchased the Vever collection of magnificent Islamic and Persian Art consisting of 39 volumes, 291 miniatures, 98 calligraphies and illuminations, 29 book-bindings, 4 textiles and examples of almost all of the classical Persian texts known. The Hirshhorn Museum and Sculpture Garden acquired the sculpture, "Soft Engine for Air Flow with Fan Transmission-Scale 5 (Model)," by Claes Oldenburg; a bronze sculpture, Cronos, by Isamu Noguchi, one of this century's most significant sculptors; and an oil on canvas painting, Berkeley #22, by Richard Diebenkorn. In addition, the National Museum of American History acquired three clockwork objects: an orrery, by Aaron Willard, Jr., which is a mechanical model of the solar system, made about 1825, and the earliest signed American orrery and one of the earliest signed American scientific instruments ever to come on the market; a tall case clock, signed by Peter Stretch and dated between 1702 and 1715, which is among the earliest clocks made in this country; and a tall case clock signed by David Rittenhouse, the leading American clockmaker, instrument maker and astronomer of the 18th century. In FY 1987, the Cooper-Hewitt Museum purchased a Tibetan Temple Hanging and these funds were instrumental in the Hirshhorn Museum and Sculpture Garden purchasing three works of art: Untitled, Jasper Johns 1954, constructions; Gymnast, William Tucker 1985, sculpture; and Untitled, Jannis Kornellis 1986, sculpture.

An additional amount of \$2.4 million is designated by the Program for innovative scholarly research projects which by definition do not lend themselves to or cannot be accommodated in a timely manner within the Federal budget process. These include multi-disciplinary research projects conducted within and between bureaus and projects that may have also been awarded external funds requiring additional matching Trust support. For example, at the National Museum of Natural History extensive efforts have been made to document the previously unknown arthropods of the tropical forest canopy. Over one million specimens were collected from five different kinds of forest throughout four seasons. These vast collections were sorted and analyzed. Over 3,000 species of beetles were found and the ecology of their associated habitats was carefully studied. Now scientists are using this information to ask important basic questions concerning plant/insect interactions, such as whether or not individual species of tropical forest canopy herbivores are restricted to specific species of trees. Scientists at the National Zoological Park are also continuing their efforts to sustain the biological diversity of our plants through improved understanding of the reproductive physiology of wildlife. Endocrinological studies of six species found at the Zoo, including the Golden Lion Tamarin and Pere David's deer, will provide insight into the basic developmental biology of the species, allow evaluation of mechanisms for preserving genetic diversity, and test the potential for introducing such strategies to other unstudied and critically endangered New World species. At the Smithsonian Astrophysical Observatory, research is underway to significantly improve the frequency stability of atomic hydrogen maser clocks. These clocks provide time and frequency signals which contribute to the success of tracking, navigation and data retrieval systems involved in interplanetary travel studies. The use of maser clocks in radioastronomy allows measurements to be made at a scale of accuracy which could be described as equivalent to reading a newspaper in Boston from Los Angeles. Funding has also supported the multi-institutional and interdisciplinary Hopi ceramics project at the Conservation Analytical Laboratory. Compositional, technological, and stylistic investigations of pottery produced in the Southwest between A.D. 1300 and

1600 focus on the nature of Hopi society before the Spanish Entrada. Analytical data derived from such techniques as neutron activation analysis, microprobe analysis, and scanning electron microscopy provide a framework within which design configurations that are sensitive indicators of social interaction may be isolated.

The remaining \$550,000 of the \$4.7 million available for this Program is allocated to conduct a wide range of educational outreach programs of benefit to the public, with special focus on diverse cultural audiences. For example, to make the Institution's traveling exhibits more accessible to the hearing disabled, these funds are being used to develop a generic, participatory "Sound Lab" to make sound visual and tactile. Also, funding was made available to produce a docent training videotape, "Part of Your General Public is Disabled." Several allocations were made for efforts to attract wider audiences. Among them are: an ongoing program in Hispanic American History; present "Quilting: A Docu-drama" designed to explore the conflict of cultural-social values among Euro-Americans, African-Americans, and American Indians during the period of the American Revolution; a presentation by the Honorable Shirley Chisholm on "Afro-Americans and the Constitution" at the opening of Black History Month; a series of film images of American Indians in conjunction with the American Sampler series segment on Traditional Dance and Song of the Seneca; and support of the audience development component of the "Field to Factory" exhibition, by the implementation of a strategy to promote visitation and active public participation in documenting the Great Migration, as well as the production of 200 special booklets for the visually and hearing impaired.

In addition, the Program supported the following other outreach activities: a program to assess the needs of the American Indian Communities to develop a multi-year outreach program at the National Museum of Natural History; a resource kit covering the historical role of the Iroquois in the Constitution of the United States; and the first of a multi-year series of programs of the diverse community based traditional, cultural expressions of the Washington, D.C. metropolitan area. The Program also sponsored a four-week workshop for science teachers, scientists, science museum educators and science supervisors from throughout the United States, to develop activity-centered science units for grades one through six. Funds for the film, "Bubbles in the Universe," will use the Smithsonian discovery of the bubble structure of the universe as an example to investigate the critical role of debate and controversy in the acceptance of scientific knowledge. Planning funds were also provided for the development of a "University of the Air," a new educational concept whose curriculum is based on the intellectual and cultural foundations of the 20th century.

In FY 1985, the Board of Regents approved an annual Trust fund allocation for the Special Exhibition Fund. The cost of exhibition programs has generally been met with Federal funds which will continue to provide the predominant financing for the Institution's overall exhibition effort, with supplemental donations being provided by individuals, foundations and corporations. Administered similarly to the Collections Acquisition, Scholarly Studies and Educational Outreach Program, the Special Exhibition Fund, with \$3.2 million in FY 1988, will provide funds for temporary or permanent exhibitions proposed by Smithsonian bureaus that, regardless of scale, are outstanding in terms of their educational value to the public. Special consideration is given to exhibitions that approach content in imaginative ways; that allow bureaus to explore new or expand current interpretive or exhibition techniques; that are worthy but, by their nature, unlikely to attract private funds; and that are likely to reach previously underserved audiences.

In FY 1987, 30 awards were made to 14 different bureaus within the Smithsonian. Examples of large, temporary exhibitions are "the House of Timur," which will deal with 15th-century Iranian and Central Asian art, and "From Parlor to Politics," which examines the role and contributions of women in the Progressive Era, 1890-1925. Important seed money was provided for large permanent installations in the National Museum of Natural History (the new Native American Halls and the Hall of Human Origins) and the National Museum of Air and Space (exhibition halls on Aerospace Computing). Small but innovative exhibitions were funded at the Hirshhorn and at the National Museum of American History. "Works" and "Directions" will focus on noteworthy contemporary artists using new formats, and "Science, Power, and Conflict," which involves only a few experimental cases, will experiment with different approaches to explain complex political and ethical issues.

Restricted Funds

Restricted Trust funds include gifts, grants and endowments from individuals, foundations, organizations and corporations that specify the use of the donation or bequest. Generally, these funds provide support for a particular exhibit or research project. The Freer fund is the largest restricted endowment of the Institution. It is strictly controlled under the terms of the original gift and bequest for the sole use of the Freer Gallery of Art.

Government Grants and Contracts

Government grants and contracts are provided by various agencies and departments for special projects which can be conducted at the Smithsonian because of its expertise in a particular area of science, history, art or education, and because of its ability to respond quickly to certain kinds of needs.

SMITHSONIAN INSTITUTION

SALARIES AND EXPENSES

Summary of FY 1989 Increases

FY 1988 Appropriation	\$201,432,000
Legislated Pay Requirements	<u>2,025,000</u>
FY 1988 Base	\$203,457,000
FY 1989 Requested Increases:	
Uncontrollable Increases	3,484,000
Program Increases	<u>9,273,000</u>
FY 1989 Request	\$216,214,000

FY 1988 BASE

PAGE NO.	UNIT	FY 1987 ACTUAL		APPROPRIATION*		LEGISLATED PAY		TOTAL		FY 1989 ESTIMATE		ANALYSIS OF INCREASE	
		FTE	AMOUNT	FTE	AMOUNT	REQUIREMENT	PAY	FTE	AMOUNT	FTE	AMOUNT	FTE	UNCONTROL - LABLE PROGRAM
192	PUBLIC SERVICE												
	Assistant Secretary for Public Service	25	1,326	23	1,267	14	1,281	23	1,294	0	1,294	0	13
197	Smithsonian Institution Press	25	1,110	29	1,192	17	1,209	29	1,226	0	1,226	0	17
	Subtotal, Public Service	50	2,436	52	2,459	31	2,490	52	2,520	0	2,520	0	30
					+ 976 690 4,125								
200	OFFICE OF INTERNATIONAL ACTIVITIES	11	622	13	787	7	794	13	799	0	799	0	5
	SPECIAL PROGRAMS												
204	American Studies and Folklife Programs	12	764	8	794	7	801	10	806	2	806	7	104
209	Int'l Environmental Science Program	10	714	13	750	4	754	13	757	0	757	0	3
215	Academic and Educational Programs	16	854	22	976	11	987	23	1,093	1	1,093	1	18
225	Museum Support Center	40	4,475	36	4,475	16	4,491	42	4,659	6	4,659	6	18
	Subtotal, Special Programs	78	6,807	79	6,995	38	7,033	88	7,421	9	7,421	9	46
232	ADMINISTRATION	256	14,247	294	21,751	182	21,933	332	24,312	38	24,312	38	271
247	FACILITIES SERVICES												
250	Office of Design and Construction	38	2,005	35	2,250	27	2,277	48	2,920	13	2,920	13	27
256	Office of Protection Services	654	18,814	732	19,369	251	19,620	757	20,717	25	20,717	25	284
	Office of Plant Services	432	35,175	490	36,026	220	36,246	503	37,654	13	37,654	13	958
	Subtotal, Facilities Services	1,124	55,994	1,257	57,645	498	58,143	1,308	61,291	51	61,291	51	1,269
	GRAND TOTAL	3,783	188,631	4,092	201,432	2,025	203,457	4,276	216,214	184	216,214	184	3,484

Note: Workyear estimates are rounded to whole workyears on all tables.

*Reflects reorganizations and the distribution of the OMB Grade Target Reduction. (See crosswalk on page 339.)

**OMB full-time equivalent ceiling is 4,110.

SMITHSONIAN INSTITUTION

"Salaries and Expenses"Report of Appropriation by Objects of Expense

(Dollars in thousands)

	1987 Actual -----	1988 Base -----	1989 Estimate -----	Increase 1989 over 1988 -----
11 Personnel Compensation.....	106,799	113,915	119,555	5,640
12 Personnel Benefits.....	14,906	22,519	24,297	1,778
13 Benefits to Former Employees.....	161	398	398	0
21 Travel & Transportation of Persons.....	1,422	1,538	1,770	232
22 Transportation of Things.....	569	725	754	29
23 Rent, Communications and Utilities.....	17,530	19,821	20,851	1,030
24 Printing and Reproduction.....	1,612	1,922	1,944	22
25 Other Services.....	24,115	20,228	22,380	2,152
26 Supplies and Materials.....	10,964	9,929	10,686	757
31 Equipment.....	8,150	11,247	12,350	1,103
Collections Acquisition.....	1,528	1,190	1,194	4
32 Land and Structures.....	864	9	19	10
41 Grants.....	0	11	11	0
42 Insurance Claims and Indemnities.....	11	5	5	0
	-----	-----	-----	-----
TOTAL.....	188,631	203,457	216,214	12,757

FY 1989 UNCONTROLLABLE INCREASES

Funds are sought to finance costs that are beyond the control of the Institution. These costs result from established practices in regulating wages; higher rental costs, and the effects of inflation and other factors. Consequently, an amount of \$3,484,000 is requested for uncontrollable costs in the following areas:

Salary and Related Costs

--Within-grade Step Increases	\$2,230,000
--Annualization of Pay Raises	675,000
--Annualization of New FY 1988 Positions	779,000
--Personnel Payroll System	122,000
--Workers' Compensation	43,000
--OMB Grade Target Reduction	-186,000
--Two Extra Workdays	<u>-916,000</u>
Total Salary and Related Costs	\$2,747,000
Utilities, Postage and Communications	\$ 400,000
Rental Space	\$ 337,000
Grand Total, Uncontrollable Increases	<u>\$3,484,000</u>

SALARY AND RELATED COSTS - A net amount of \$2,747,000 is required for the projected higher salary and benefits costs in FY 1989 for FY 1988 staff. Costs required for within-grade increases (\$2,230,000) are calculated for each of the bureaus and offices, taking into consideration workyears authorized by the Office of Management and Budget (OMB). Funds also are required in FY 1989 to cover the annualization of the January, 1988 legislated pay raises (\$675,000); annualization of partial-year funding of new positions approved in FY 1988 (\$779,000); increased operating costs for the new Personnel Payroll System (\$122,000); and increased workers' compensation (\$43,000). These requested increases are partially offset by reductions of \$186,000, which was mandated by OMB for positions in grades 11 through 15; and \$916,000 attributed to two less paid days.

Within-grade Step Increases - A sum of \$2,230,000 is sought in FY 1989 for within-grade step increases. For General Schedule employees, these increases are required by Section 5335 of Title 5, United States Code. Wage employees are covered by law and prevailing rates. Increases include the part-year cost of new actions scheduled to occur in the budget year, as well as the cost of annualizing step increases occurring in FY 1988.

Annualization of Pay Raises - Funds of \$675,000 are required to annualize the cost of General Schedule, Merit Pay, and Wage Pay increases effective in FY 1988. In accordance with the pay plan established by the President under Section 5305 of Title 5, United States Code, annual salaries for Smithsonian General Schedule and Merit Pay level employees were increased effective January 3, 1988 as a result of the Continuing Resolution, Public Law 100-202, and as transmitted by Executive Order 12622. Prevailing practices required Wage Pay scales to be reviewed by Wage Finding authority in each geographic area. Public Law 100-202 also provides that Wage Board

employees receive the same pay increases as General Schedule employees. An amount of \$675,000 is required to provide full-year funding in FY 1989 for these legislated pay increases granted in FY 1988.

Annualization of New Positions Approved in the FY 1988 Budget - An amount of 36.82 workyears and \$779,000 is required to annualize the partial-year funding of new positions approved in the FY 1988 budget. Of this amount, a sum of 24.62 workyears and \$600,000 reflects the restoration of funding cut during FY 1988 Congressional action to take into account salary lapse for new FY 1988 positions that had been projected to be hired on October 1, 1987. In addition, funding of 12.2 workyears and \$179,000 is necessary to annualize funding for new staffing at the Smithsonian Tropical Research Institute's Tupper Laboratory and Conference Center and Barro Colorado Island and Gamboa facilities. Only partial-year funding was contained in the FY 1988 budget as these position are projected to be hired during the second half of the fiscal year.

Personnel Payroll System - The Institution has entered into an agreement with the Department of Agriculture's National Finance Center (NFC) for computer services in support of personnel management and payroll production with full documentation, enhanced capability, improved internal controls and guaranteed maintenance. The new systems became operational in FY 1988. The annual operating costs are estimated at approximately \$780,000, based on NFC's cost for all communication services and \$101.68 per employee (civil service and Trust, including temporaries regardless of duration on the payroll) times an estimated 7,000 employees. The Trust share of the costs for its employees is estimated to offset one-third of the total requirement. With base funds of \$400,000 appropriated in FY 1988, an increase of \$122,000 is required for the Federal share of processing the payroll and personnel data and communication services.

Workers' Compensation - An amount of \$43,000 is required to meet the provisions of Section 8147(b) of Title 5, United States Code as amended on April 21, 1976 by P. L. 94-273. This law provides for payments to be made to employees for injuries and to their families in cases where work accidents result in employees' deaths. These payments are determined and made by the U. S. Department of Labor's Employment Standards Administration, which subsequently bills agencies for costs incurred for their employees. The Institution continues to pursue its Accident Safety Program administered by the Office of Environmental Management and Safety. This office conducts employee training in safe working environments and supports a staff whose duties include identifying and eliminating potential accident hazards. The FY 1989 bill for the Institution's Federal portion totals \$881,000. (This bill covers the actual expenses incurred for the period July 1, 1986 through June 30, 1987.) With an amount of \$838,000 in the Institution's base for workers' compensation, additional funds totaling \$43,000 are requested.

OMB Grade Target Reduction - In FY 1985, at the direction of the President, the Office of Management and Budget and the Office of Personnel Management implemented a joint initiative to improve the management of positions and lower the average grade levels in the 11-to-15 grade range. Thus far, the reduction assessed the Smithsonian is \$1,306,000. A final sum of \$186,000 will be relinquished in FY 1989. The cumulative reduction over five years is \$1,492,000.

Two Extra Work Days - Currently, base funding is available for employee compensation for a 262-day workyear based on a 2,087 hourly rate calculation. FY 1989, however, contains 260 workdays; therefore an amount of \$916,000 for employee salaries and benefits costs is being relinquished.

UTILITIES, POSTAGE, AND COMMUNICATIONS - In FY 1988, a base of \$16,756,000 is available to fund the costs of electricity, steam, gas, fuel oil, water, postage and communications of nearly all Institution facilities including the Quadrangle. Due primarily to increased consumption associated with full operation of the Quadrangle, as well as continued installation and upgrading of computer equipment throughout the Institution, an amount of \$400,000 is sought to cover higher costs of these items.

Projections of future year utilities costs are based on analyses which take into account a variety of factors. These include comparative data on actual energy consumption in previous years for each facility; adjustments for normal weather conditions for this area based on information provided by the National Weather Service; actual and projected rates charged by utility companies; actual and anticipated reimbursements for utility costs from concessions, museum shops, and the Friends of the National Zoo; modifications to work and public spaces within facilities; vigorous energy conservation efforts under way in all Smithsonian buildings; improvements to heating, ventilating and air conditioning systems and components installed throughout the physical plant; the design of new facilities constructed; and anticipated increases in consumption due to the installation of computers and other equipment used throughout the Institution in support of program objectives.

The following table shows the costs and base funds available to cover the components of the Utilities account between FY 1987 and FY 1989.

ANALYSIS OF UTILITIES AND COMMUNICATIONS COSTS
FY 1987 - FY 1989

	<u>FY 1987</u> <u>ACTUAL</u>	<u>FY 1988</u> <u>ESTIMATE</u>	<u>FY 1989</u> <u>ESTIMATE</u>
<u>ELECTRICITY</u>			
<u>Use</u> - Millions of KWH	105.0	113.2	112.3
<u>Unit Cost</u> - Average per KWH	.070	.067	.068
<u>Cost</u> - \$000's	\$7,357	\$7,529	\$7,674
FY 1989 Estimated Cost			\$7,674
FY 1988 Base			<u>\$6,903</u>
Base Shortage, Electricity			\$ 771
 <u>STEAM</u>			
<u>Use</u> - Millions of Pounds	205.1	224.0	224.0
<u>Unit Cost</u> - Average per 1,000 lbs.	15.5	15.5	15.5
<u>Cost</u> - \$000's	\$3,178	\$3,472	\$3,472
FY 1989 Estimated Cost			\$3,472
FY 1988 Base			<u>\$3,318</u>
Base Shortage, Steam			\$ 154
 <u>GAS</u>			
<u>Use</u> - Millions of Cubic Ft.	1.259	1.267	1.171
<u>Unit Cost</u> - Average per Cubic Ft.	.5938	.5938	.5938
<u>Cost</u> - \$000's	\$747	\$752	\$ 713
FY 1989 Estimated Cost			\$ 713
FY 1988 Base			<u>\$1,100</u>
Base Surplus, Gas			\$ 387
 <u>FUEL OIL/WATER</u>			
<u>Cost</u> - \$000's	\$167	\$150	\$150
FY 1989 Estimated Cost			\$150
FY 1988 Base			<u>\$250</u>
Base Surplus, Fuel Oil/Water			\$100
 <u>TELEPHONE</u>			
<u>Cost</u> - \$000's	\$3,060	\$3,500	\$3,597
FY 1989 Estimated Cost			\$3,597
FY 1988 Base			<u>\$3,435</u>
Base Shortage, Telephone			\$ 162
 <u>POSTAGE</u>			
<u>Cost</u> - \$000's	\$1,502	\$1,700	\$1,900
FY 1989 Estimated Cost			\$1,900
FY 1988 Base			<u>\$1,750</u>
Base Shortage, Postage			\$ 150
 <u>TOTALS</u>			
FY 1989 Estimated Cost			\$17,506
FY 1988 Base			\$16,756
Anticipated Reimbursements			<u>\$ - 350</u>
FY 1989 Requested Increase			\$ 400

Electricity - The major component of the Utilities account is electricity. Estimates of electrical usage and consumption take into consideration full occupancy of the Quadrangle facility as well as an anticipated five-percent fuel rate increase in FY 1989, which PEPCO has requested from the D.C. Public Service Commission. Consumption and costs for FY 1989 also reflect the release of the old Museum of African Art complex on Capitol Hill and the Radiation Biology Laboratory building in Rockville, Maryland. Although energy conservation efforts remain in effect and have shown demonstrable impact on consumption over the past several years, the continued installation and upgrading of computer equipment throughout the Institution are expected to result in increased consumption. As a result, \$771,000 in additional base funds are required to cover the estimated electricity costs in FY 1989.

Steam - The projected deficit of \$154,000 for steam is attributable to the full occupancy of the Quadrangle facility.

Gas - Rates for gas have been estimated based on lower actual costs in FY 1987. The release of the old Museum of African Art complex on Capitol Hill and the Radiation Biology Laboratory building in Rockville has led to a lowering of projected consumption in FY 1989 and has resulted in a base surplus of \$387,000 being projected for FY 1989.

Fuel Oil and Water - The estimated surplus of \$100,000 for fuel oil and water is attributable to the release of the Radiation Biology Laboratory building in Rockville, Maryland and lower usage of fuel oil than previously expected at the Museum Support Center.

Telephones - Efforts continue to limit telephone costs through increased monitoring and review of long distance calls by management officials, limited access to long distance lines to reduce the possibility of abuse and increased monitoring of telephone charges. Despite these efforts, an additional \$162,000 is requested in FY 1989 to enable the Institution to meet all expected telephone costs. Additional funds are requested to allow the Institution to continue expanding data communication capabilities, particularly those involving wide access to payroll, personnel and collections management information and other data bases from remote locations. Additionally, expected costs associated with the FTS 2000 long distance network, administered by the General Services Administration, are expected to contribute to the increase.

Postage - Ongoing efforts to contain postage costs continue to limit the increases necessary for providing postage services to the Institution. Elimination of first-class domestic package mailings and reduced express mail services for domestic mailings have been successful in reducing postage costs. Despite these successes, the Institution is projecting a \$150,000 deficit for postage due to the proposed increase of first-class postage rates anticipated in FY 1989 and the corresponding rate increases for other classes of mailings, as well as the increased volume of mailings associated with program activities and public information requests.

Energy Conservation - The Institution is continuing efforts to monitor and limit all forms of energy consumption. Ongoing efforts include utilizing a computer-based energy management system that reduces peak energy demands by cycling motors on and off, and when necessary selectively shutting down equipment and monitoring all buildings for fluctuations or malfunctions in their operating systems; continuing the phased program of performing comprehensive building energy audits; renovating heating, ventilating and air conditioning, plumbing and electrical systems within the Institu-

tion's facilities; and reducing lighting levels in work and non-public areas. Additional efforts include installing more efficient lighting fixtures; operating heating and air conditioning systems at the minimum level necessary to prevent damage to the collections; curtailing electrical consumption during non-public hours; and increased attention to energy conservation when determining space use, modifying existing space and designing new facilities.

Through the use of our modern facilities management computer system, attention is now being directed to controlling all building lighting systems. This computerized control has enabled the lights to be turned on and off as use fluctuates thereby helping to reduce our overall electrical consumption. Computerized lighting controls are now in place at the Museum of Natural History and the Quadrangle. Installation of such a system in the Museum of American History is scheduled for FY 1988, with installation of such systems in other major buildings scheduled for succeeding years.

RENTAL SPACE - For FY 1989, an amount of \$337,000 for the central rental account, managed by the Office of Plant Services, is required not only for the Federal proportional share of the rental expenses for administrative activities located at L'Enfant Plaza and the Smithsonian Institution Service Center at 1111 North Capitol Street, but also for the research bureaus of the Archives of American Art in New York City and Boston, Massachusetts. The amounts shown on the following table reflect anticipated costs for rental space at these sites:

FEDERAL RENTAL PROGRAM ADMINISTERED BY THE OFFICE OF PLANT SERVICES
FY 1987 - FY 1989

(\$000's)

	FY 1987		FY 1988		FY 1989	
	Actual Cost		Estimated Cost		Estimated Cost	
	<u>Federal</u>	<u>Trust</u>	<u>Federal</u>	<u>Trust</u>	<u>Federal</u>	<u>Trust</u>
L'Enfant Plaza	\$ 389	\$904	\$ 408	\$942	\$ 802	\$ 951
North Capitol St.	930	--	1,017	--	950	139
Archives of American Art:						
- New York	61	--	150	--	155	--
- Boston	<u>7</u>	<u>--</u>	<u>8</u>	<u>--</u>	<u>13</u>	<u>--</u>
Total Costs	\$1,387	\$904	\$1,583	\$942	\$1,920	\$1,090
Base	<u>\$1,349</u>	<u>\$904</u>	<u>\$1,583</u>	<u>\$942</u>	<u>\$1,583</u>	<u>\$1,090</u>
Surplus/(Deficit)	\$ (38)	\$ --	\$ --	\$ --	\$(337)	\$ --

The unique organizational status of the Smithsonian Institution presents an ongoing dilemma for maintaining parity between Federal and Trust support for institutional administrative costs, with special consideration given to revenue producing activities. Since FY 1980, the rental space at L'Enfant Plaza and North Capitol Street has been designated as a shared Federal/Trust expense, as these locations accommodate certain administrative functions supporting both Federal and Trust activities in addition to various program activities. Heretofore, the method of cost

sharing between Federal and Trust funds for the rental account has been based on proportional cross program expenditures, without acknowledging actual space usage at either location and other alternatives for isolating the administrative costs. This approach is essentially flawed, since it is based on total costs incurred by a program rather than staff costs or space necessary to administer the program.

Over the past few years, space utilization at both locations has changed as has the administrative space requirements for auxiliary activities within non-rented Smithsonian Institution buildings. Consequently, during the periodic review of cost allocation methods, the sharing of rental expenses became an area of concern. Based on a review of the current rental space utilization and the algorithm for administrative rental expense distribution, the decision has been made to use an alternative method based on programmatic salary costs to allocate shared expenses. The new method is consistent with the approved allocation of indirect costs (including rent) to government grants and contracts by the Defense Contract Audit Agency/Office of Naval Research (DCAA/ONR), yields a more valid comparison of administrative activity, and results in a more equitable distribution of related rental costs between Federal and Trust support.

In addition, the new approach incorporates expenses for administrative space previously borne exclusively by either Federal or Trust funds. For example, the rental property at the North Capitol Street Service Center has been supported by Federal funds with offsetting payment for the Museum Shops warehouse space, until the relocation of that operation in FY 1986 when the total costs were then sustained by appropriated funds. Now, however, cost sharing from the Smithsonian Institution Press and Smithsonian magazine, as well as administrative activities occupying space at this facility, also will be recognized.

The estimate for FY 1989 Federal costs for L'Enfant Plaza, which reflects annual cost increases specified in the lease agreement, includes support from appropriated funds for all program space, such as the Office of Folklife Programs and the Office of Fellowships and Grants. The expense allocation for applicable administrative space is based on the ratio of Federal and Trust program salary expenses. In addition, the Smithsonian Institution Press rent costs are allocated on the ratio of Federal to Trust salaries to recognize the dual nonprofit/for-profit function of the Press, including production of research and educational materials, government forms, manuals and reports as well as marketing books and recordings. The policy of charging equivalent rent to the auxiliary activities, specifically Smithsonian National Associates Program, Resident Associates Program and the Smithsonian magazine will continue. That is, these activities are charged for the administrative office space that they occupy in non-rented Institution buildings according to the number of square feet occupied times the equivalent rental costs per square foot of space at L'Enfant Plaza. Payments by the auxiliary activities, including the Smithsonian Institution Press, partially offset the total rent charge for L'Enfant Plaza.

The total rental expense for space at 1111 North Capitol Street also reflects the annual cost increase specified in the current long-term lease agreement. The Federal/Trust proportional share is based upon the aforementioned allocation of administrative space with programmatic rental space supported by appropriated funds.

The rental expenses for the Archives of American Art have been revised to acknowledge the unavoidable delays in occupying the proposed new facilities. However, the new space, located in the area where New York's art museums and galleries are concentrated, will be fully occupied in FY 1988. An additional amount of \$5,000 is

required for FY 1989. An amount of \$5,000 is required for the Archives of American Art's Boston location to cover annual cost increases specified in the lease agreement.

The Federal share projected for the Central rental account in FY 1989 totals \$1,920,000. A sum of \$1,583,000 is anticipated for FY 1988. Therefore, an additional amount of \$337,000 is required to defray space rental costs at these locations in FY 1989.

Salary and Related Costs

FY 1989
(Dollars in Thousands)

Unit	Within- grade Increases	Annuali- zation of Pay Raises	Less Two Work Days	Annuali- zation of new FY 1988 Positions	Total
Assistant Secretary for Research	14	4	(8)		10
Smithsonian Astrophysical Observatory	101	31	(42)	23	113
Smithsonian Tropical Research Institute	56	17	(20)	225	278
Smithsonian Environmental Research Center	13	4	(6)		11
National Zoological Park	178	55	(76)	69	226
Smithsonian Archives	9	3	(4)		8
Smithsonian Institution Libraries	53	16	(22)	8	55
Assistant Secretary for Museums	14	5	(4)		15
National Museum of Natural History	319	97	(134)	154	436
National Air and Space Museum	124	38	(50)	6	118
National Museum of American History	192	59	(82)	73	242
National Museum of American Art	63	19	(26)		56
National Portrait Gallery	49	15	(20)	16	60
Hirshhorn Museum and Sculpture Garden	39	12	(16)	3	38
Center for Asian Art	36	11	(16)	29	60
Archives of American Art	13	4	(6)		11
Cooper-Hewitt Museum	16	5	(6)		15
National Museum of African Art	29	9	(10)	12	40
Anacostia Museum	10	2	(4)		8
Conservation Analytical Laboratory	26	8	(10)		24
Office of Exhibit Central	25	8	(10)	6	29
Smithsonian Traveling Exhibition Service	8	2	(4)	4	10
Assistant Secretary for Public Service	17	4	(8)		13
Smithsonian Institution Press	19	6	(8)		17
Office of International Activities	8	1	(4)		5
American and Folklife Programs	8	3	(4)		7
International Environmental Science Program	4	1	(2)		3
Academic and Educational Programs	13	3	(4)	6	18
Museum Support Center	18	6	(6)		18
Administration	209	61	(76)	98	292
Office of Design and Construction	30	9	(12)		27
Office of Protection Services	275	84	(116)	41	284
Office of Plant Services	242	73	(100)	6	221
Total	2,230	675	(916)	779	2,768

OFFICE OF THE ASSISTANT SECRETARY FOR RESEARCH

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	20	1,374	1	78	-	23	16	596	-	609
FY 1988 -Estimate	29	1,205	1	152	-	1	7	411	-	718
-Base	29	1,219								
FY 1989 Estimate	29	1,229	1	152	-	111	3	441	-	223

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	29	-	29
11 Personnel Compensation.....	769	7	776
12 Personnel Benefits.....	105	3	108
21 Travel.....	36	-	36
22 Transportation of Things.....	1	-	1
23 Rent, Communications & Utilities.....	12	-	12
24 Printing & Reproduction.....	2	-	2
25 Other Services.....	247	-	247
26 Supplies & Materials.....	36	-	36
31 Equipment.....	11	-	11
Total	<u>1,219</u>	<u>10</u>	<u>1,229</u>

Analysis of Increase

Necessary Pay..... 10

ABSTRACT - The Office of the Assistant Secretary for Research provides guidance, planning and overall policy direction to the Institution's research efforts and to research support activities. In carrying out these duties, the Office is responsible for tracking research trends both internally and externally in the arts, humanities and sciences. Also included in this line item is the Joseph Henry Papers, which is a documentary publication project dedicated to collecting, transcribing, editing, and publishing the manuscripts of Joseph Henry, a pioneer American physicist and first

Secretary of the Smithsonian Institution. No program increase is requested for FY 1989. Necessary pay of \$10,000 is required for existing staff.

PROGRAM - I. The Office of the Assistant Secretary for Research: With base resources of 24 workyears and \$1,006,000, this Office, in concert with the Secretary and other appropriate management staff, supervises the research activities of the Institution. The Office also serves as the major institutional liaison for research centers in the United States and abroad.

A fundamental responsibility of this Office is the development of guidelines to ensure the superior quality of research conducted at the Institution. This entails providing guidance on shifts of emphasis, suggestions for new areas of research, and access to state-of-the-art facilities and equipment, and advising on the selection and promotion of scholarly staff. In addition, the Office strives to better disseminate Smithsonian research findings to the public and to specialized audiences. FY 1988 marks the retirement of the present Assistant Secretary and the transition to a new executive. Changes in the Office mission will be reflected in future years' budget submissions.

Carbon Dating Services - Contract services for dating, cleaning, and conserving objects is significant to Smithsonian research in such areas as anthropology, geology, and paleontology. In FY 1987, the Institution established a competitive fund to support carbon dating. Proposals are submitted and reviewed by an internal committee for scholarly merit and cost efficiency. This fund has proved to be extremely beneficial in contracting for services which lead to the acquisition of valuable data for a range of research projects.

Solar Research Studies - The Smithsonian pioneered studies in the collection of solar data, particularly with respect to the measurement of ultraviolet radiation. The solar studies program has been enhanced by a new collaboration between the Institution and the National Oceanic and Atmospheric Administration. The new effort has focused not only on studies of the solar spectrum, but on its effects on the Earth. These studies are addressing such topical issues as the atmospheric concentration of ozone. In Antarctica, monitoring of the hole in the ozone layer began in 1987. This unique phenomena may be a key to future understandings of atmospheric conditions. The researchers also are seeking to determine if ozone shifts are a natural occurrence or a man-made phenomenon. These studies are of utmost importance if man is to avert the deadly effects of the shifting concentrations of atmospheric ozone. Future monitoring activities in Antarctica may be curtailed due to logistical difficulties. The retirement of the director of this unit in early FY 1988 has provided the Institution an opportunity to reassess this activity in light of new opportunities and advanced technologies. For FY 1989, a major effort will be made to analyze voluminous data sets previously accumulated and to develop a system for rapid dissemination among the user community. In addition, new monitoring sites and equipment will be employed to take advantage of new scientific findings.

II. The Joseph Henry Papers - With base resources of 5 workyears and \$213,000, the Joseph Henry Papers collects, transcribes, edits, researches, and publishes the manuscripts of Joseph Henry. This entails extensive searches in this country and abroad for extant Henry documents. Publication objectives include a 15-volume letterpress series, an indexed microform edition of approximately 90,000 items, and special publications aimed at a more general audience. The Papers of Joseph Henry is a source of otherwise unpublished and often previously unknown letters and papers that shed light on the history of science, the development of Federal policy towards the

sciences, and on the institutional and social structure of the scientific community of the 19th century.

The Henry Papers project serves also as an essential resource for research in the history of science and the cultural history of the United States. Copies of the manuscripts located by the staff provide the scholarly community with a centralized source of documentation relating to Joseph Henry and his colleagues, complemented by the Bell-Henry Library. The Bell-Henry Library is maintained by the Project and contains the personal libraries of both Alexander Graham Bell and Joseph Henry. Requests for access to both the manuscript collections and the library by Smithsonian staff, Smithsonian Fellows, and visiting scholars increased sharply during FY 1987 and the trend is expected to continue in FY 1988.

The Henry Papers is completing work on the sixth volume of the series and publication is expected in FY 1989. This volume, covering the years 1844-1846, details the end of Joseph Henry's professorship in natural philosophy at the College of New Jersey (now Princeton University) where he was still actively engaged in experimentation in electricity and magnetism. It also chronicles the establishment of the Smithsonian Institution and Henry's selection as its first Secretary in December 1846. Editorial work on the seventh volume, which will document the years 1847-1849, will commence in FY 1988 and continue into FY 1989. The focus of this volume will be Henry's efforts to ensure that the Smithsonian's primary function is the support of original research. By the end of FY 1988, the Henry Papers plans to be fully automated, allowing the seventh volume of the series (and the first of the Smithsonian Years) to be prepared entirely on computers. Further systemization of the data gathered during the editing of the Henry manuscripts will allow for greater quantitative analysis.

The Henry Papers will continue its sponsorship of the 19th-Century Seminar and its educational outreach and cooperative activities. The 19th-Century Seminar, an academic forum, presented speakers from a number of countries, including Australia and the Federal Republic of Germany, in FY 1987. These works-in-progress seminars will continue to provide the scholarly community the opportunity to hear and discuss topics common to the 19th century with historians from throughout the world. During FY 1987, the Henry Papers hosted a Smithsonian predoctoral fellow and three interns, including a minority student. It also provided the guest curator for the National Museum of American History's exhibition celebrating the tricentennial of Newton's Principia.

NONAPPROPRIATED SOURCES OF FUNDING:

I. The Office of the Assistant Secretary for Research: Unrestricted General and Special Purpose Funds - These funds are provided by annual allotments and are used primarily to support three significant international foundations which operate field research stations used by Smithsonian staff members as well as by the world scientific community: the Seychelles Islands Foundation operates the former Royal Society station on the Island of Aldabra, located in the Indian Ocean, where biological research is conducted; the Charles Darwin Foundation operates a biological research station in the Galapagos Islands; and the King Mahendra Trust for Nature Conservation provides scholars with access to a unique environment on the Indian subcontinent by operating a field station in the terai region (a lowland, grassy plain) of Nepal where significant ecosystem research is in progress. Smithsonian support facilitates the continued accessibility of these areas for the research community at large. Support also is provided for the exchange of scholars and scientific information between the

Smithsonian and a number of nations, principally, the People's Republic of China and Cuba.

Restricted Funds - These consist of restricted endowments, gifts and grants from individuals, foundations and corporations which specify the use of the donation or bequest. Competitive awards are made to Smithsonian units from the Seidell Endowment Fund, administered by this Office, which provides for dissemination of scientific information. The FY 1987 awards from the Seidell Endowment are reflected in the expenditures of the recipient organizations. Ecotechnics provided support to develop and construct a Chesapeake mesocosm and later a tropical estuarine mesocosm.

Government Grants and Contracts - Contract funds have been provided by the Office of Naval Research for the continuation of studies in the area of manpower research and development. A grant from the Agency for International Development (AID) provides funds for the continuation, expansion and operation of the research laboratory at Grand Turk Island.

II. The Joseph Henry Papers: Restricted Funds - The Joseph Henry Papers will receive support in FY 1988 from the National Academy of Sciences and the Richard Lounsbery Foundation. These funds will be used to provide the Joseph Henry Papers with a research assistant to aid in the production of the manuscript volumes of the letterpress edition. Application for additional funding to support the research assistant position in FY 1989 has been made. The Smith College Tuition fund will be used to defray costs of research by the support staff and volunteers. None of these funds are anticipated to recur in FY 1989.

Funding from the National Science Foundation will be received in FY 1988 and will partially defray the costs of a Joint Seminar on nationalism and internationalism in science in conjunction with the Australian bicentennial. These funds are not anticipated to recur in FY 1989.

SMITHSONIAN ASTROPHYSICAL OBSERVATORY

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	108	9,920	49	2,580	43	1,825	-	42	92	12,100
FY 1988 -Estimate	105	9,892	51	2,977	43	1,748	-	140	94	15,849
-Base	105	9,984								
FY 1989 Estimate	108	10,416	51	3,078	43	1,600	-	28	100	20,191

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	105	3	108
11 Personnel Compensation.....	5,273	240	5,513
12 Personnel Benefits.....	630	72	702
21 Travel.....	105	-	105
22 Transportation of Things.....	41	-	41
23 Rent, Communications & Utilities.....	549	120	669
24 Printing & Reproduction.....	28	-	28
25 Other Services.....	1,912	-	1,912
26 Supplies & Materials.....	350	-	350
31 Equipment.....	1,096	-	1,096
Total	<u>9,984</u>	<u>432</u>	<u>10,416</u>

Analysis of Increase

Necessary Pay.....	113
Program Funds.....	319

ABSTRACT - The Smithsonian Astrophysical Observatory (SAO) located in Cambridge, Massachusetts, conducts basic astrophysical research in the following interrelated disciplines: atomic and molecular physics, high energy astrophysics, optical and infrared astronomy, planetary sciences, radio astronomy and geoastronomy, solar and stellar physics, and theoretical astrophysics. SAO cooperates in its scientific programs with the Harvard College Observatory (HCO), and together the two observatories form the Center for Astrophysics (CfA). SAO also operates the Fred

Lawrence Whipple Observatory (FLWO), on Mt. Hopkins, Arizona, the site of the Multiple Mirror Telescope (MMT), a joint project with the University of Arizona.

Scientific data are obtained from laboratory experiments conducted in Cambridge; telescopic observations, especially at FLWO; and space observations utilizing satellites, rockets, and balloons. The reduction and analysis of these data are performed mostly with SAO's computer systems in Cambridge. The resulting astrophysical information and scientific interpretations are published in scientific journals and reports. These results are also conveyed to the scientific community and to the public through lectures and more general articles and books.

For FY 1989, an increase of 3 workyears and \$319,000 is requested to hire a project scientist, a digital leader, and a software leader to initiate the design of a submillimeter telescope array (3 workyears and \$199,000); and to meet increased space rental costs for SAO facilities in Cambridge, Massachusetts (\$120,000). Non-personnel support for the development of a submillimeter telescope array and for the conversion of the Multiple Mirror Telescope is requested as no-year funding under the Major Scientific Instrumentation line-item (See discussion under Major Scientific Instrumentation for detail). The FY 1988 and FY 1989 estimates in the table above reflect a decrease of \$525,000 associated with the conversion of the MMT, since this base amount is proposed for transfer to the new line-item (see discussion under Major Scientific Instrumentation for detail). Necessary pay of \$90,000 is required for existing staff, along with 0.5 workyears and \$23,000 required to annualize the partial-year funding of 2 new positions approved in the FY 1988 budget.

PROGRAM - SAO is a leading international astrophysical research center. The Observatory was founded in 1890 by Samuel Pierpont Langley, the third Secretary of the Institution, and moved to Cambridge, Massachusetts in 1956. SAO has pioneered in studies of solar-terrestrial relationships; establishment of a worldwide network of stations to track the first artificial earth satellites; application of new technology to telescope design; discoveries of cosmic X-rays; and surveys of the distribution of galaxies in space. SAO's leadership in astrophysics grows out of a broad and diversified approach to research. Observations at radio, infrared, optical, ultraviolet, and X-ray wavelengths involving innovative designs are combined with theoretical studies to provide deeper understanding of astrophysical processes.

SAO's research programs are concentrated in seven divisions, with the different efforts largely complementing each other: atomic and molecular physics, high energy astrophysics, optical and infrared astronomy, planetary sciences, radio astronomy and geoastronomy, solar and stellar physics, and theoretical astrophysics. SAO also maintains an engineering department, a computational facility, and an extensive astronomical library. In addition, because it is located outside the Washington metropolitan area, SAO has its own administrative support structure funded by Federal funds and by indirect charges to grants and contracts.

SAO also operates the Minor Planet Center and the Central Bureau for Astronomical Telegrams for the International Astronomical Union (IAU). The Central Bureau for Astronomical Telegrams is responsible for receiving, verifying, cataloguing and disseminating information about transient astronomical phenomena such as the discoveries of comets and asteroids that approach the Earth, and of novae and supernovae. For comets and asteroids, the Bureau computes orbits and provides information on where the objects can be observed in the future. The Bureau provides such information to 750 astronomers and observatories around the world. The Minor

Planet Center concentrates on asteroids and comets and provides detailed information on these objects to some 250 subscribers worldwide.

The past year produced a number of significant scientific accomplishments by SAO scientists:

-- The major event of the year in astrophysics was the supernova explosion in the Large Magellanic Cloud, visible in the Southern Hemisphere. This supernova, the brightest in almost 400 years, offered an unparalleled opportunity for study with an extraordinary variety of instruments. Scientists from SAO quickly headed to the Cerro Tololo Observatory in Chile bringing a new electronic camera they had designed and built. They used a new technique of astronomical imaging--rapid picture taking to avoid the blurring caused by motions in the earth's atmosphere--to photograph the supernova. The images showed the supernova, but they also revealed a close-by companion object that is almost one tenth the brightness of the supernova. Since the supernova is as bright as billions of normal stars, this companion object is also incredibly bright, and must have been created by the supernova since it was not there before the explosion. Its presence is baffling theorists and observers, and further observations by SAO scientists are underway; the results are eagerly awaited by the scientific community.

-- Why did dinosaurs disappear about 65 million years ago? Was it the result of comets crashing into the Earth, thus raising vast dust clouds that choked off the sunlight and resulted in the demise of the dinosaurs? This view has gained wide acceptance, but how these comets came to be in a position to hit the Earth is a subject of some controversy. One speculation is that the sun has a very distant and faint companion star, nicknamed Nemesis, that takes almost 23 million years to complete one orbit around the sun. According to this theory, each time Nemesis passes the vicinity of the sun it produces small tugs on the myriads of comets thought to reside on the outer fringe of our solar system. Some of these comets would thereby be deflected into the inner solar system, and a tiny fraction of them could crash into the earth. However, observations made by an SAO scientist indicate that a companion star such as Nemesis is not likely to exist in orbit about the sun. A survey of 250 stars similar to the sun showed that none has a companion as far away from it as is required for the separation of Nemesis from the sun; any two stars in such a configuration would have been disrupted early on by chance encounters with other stars.

-- Using interferometric techniques developed at radio wavelengths, SAO scientists have built an optical interferometer having extremely high angular resolution. The instrument, a stellar interferometer erected at the Mt. Wilson Observatory in California, is part of a joint project of SAO, the Massachusetts Institute of Technology, the Naval Research Laboratory, and the Naval Observatory. This interferometer was completed in the fall of 1986 and began a major campaign of daily observations in 1987 to determine the positions of stars on the sky to an accuracy 10 to 100 times greater than that achievable with conventional telescopes. The angular diameters of a large number of stars also will be measured for the first time; in addition, the instrument will be used to search for massive planetary companions of nearby stars.

These and other research results obtained by SAO scientists have been published in scientific journals. Approximately 200 such papers appear each year. A brief summary of the research conducted in each of SAO's seven scientific divisions follows. In each section, the first paragraph describes the research program in general terms

and the subsequent paragraphs describe recent accomplishments, in addition to those highlighted above.

Atomic and Molecular Physics - In order to interpret observations of astronomical objects it is necessary to understand the atomic and molecular processes involved. The major objective of the research of the Atomic and Molecular Physics Division is to obtain such information using laboratory and theoretical studies.

SAO scientists are measuring several ways in which oxygen molecules in the Earth's atmosphere can be broken apart by sunlight. In addition, they have made the first theoretical calculation of the rate of production of oxygen atoms by molecules of oxygen which absorb an electron and break apart before the captured electron can escape. These processes are important elements of the chemistry of the ozone in the stratosphere, the layer that protects us from the harmful ultraviolet rays of the sun. They are also vital components for understanding the mechanism of the "greenhouse" effect that is thought to be causing a warming of the Earth.

Carbon monoxide, a single atom of carbon combined with a single atom of oxygen, is one of the most common interstellar molecules. It is also one of the easiest to detect. Astronomers map the distribution of carbon monoxide as a way of tracing the extent of giant clouds of molecules in the Milky Way. But in order to interpret these maps properly, it is necessary to understand the detailed processes by which carbon monoxide molecules are broken down by starlight. Scientists at SAO have calculated ways in which this process may occur and carried out corresponding measurements in collaboration with the Japanese National Laboratory for High Energy Physics, using radiation from their "Photon Factory." Computations made by SAO scientists have also revealed that the simple, and supposedly abundant, molecule consisting of one atom of hydrogen and one atom of nitrogen can be readily broken down by starlight, explaining the mystery of why such a simple molecule had not been found in the interstellar medium.

High Energy Astrophysics - Research in high energy astrophysics is concentrated on some of the most energetic objects and processes in the universe. Scientific studies are directed at understanding the mechanisms that generate X-ray radiation, the amount of matter in the universe, and the formation, evolution, and ultimate fate of the universe. Observations must be made from balloons, rockets, the Space Shuttle, or satellites, because X-rays are absorbed by the earth's atmosphere. SAO scientists and engineers are currently involved in the analysis of X-ray data and in the design and development of new instrumentation for future space science missions.

Some of the most violent events in the universe take place in the heart of galaxies and the enigmatic objects known as quasars. The mechanism producing this behavior may involve matter falling onto a massive black hole, perhaps a million or even a billion times heavier than our sun. Although these objects radiate immense amounts of energy across the spectrum from low energy radio waves to the extremely high energy X-rays and gamma-rays, their behavior can alter over periods as short as a few days. SAO scientists have been piecing together a picture of the way the emission varies in time in different energy bands. Preliminary results suggest that one process may generate the infrared and X-ray emission, while another process, involving a disk-like structure of material spiraling inward toward the central black hole, may be responsible for the optical, ultraviolet, and lowest energy X-ray radiation that is observed.

Catalogues and maps are important resources for understanding the universe. For example, when the recent supernovae flared in the southern sky, almost the first question asked was, "What was there before--what kind of star blew itself apart with such an enormous release of energy?" That question could only be answered because astronomers had preserved records of their observations of the Large Magellanic Cloud. Similarly, the X-ray satellite named Einstein, created largely through the efforts of SAO scientists and engineers, produced a priceless archive of observations of 10 percent of the sky. Using these data, SAO scientists have been able to catalogue X-ray sources and to make maps of the distribution of cosmic X-rays, which will be useful to astronomers both in the present and in the future. For example, these tools will provide the basis for future systematic studies involving stars, galaxies, clusters of galaxies and quasars.

SAO scientists and engineers are working with the National Aeronautics and Space Administration (NASA) and industry on detailed definition and design studies of the Advanced X-ray Astrophysics Facility (AXAF), one of the major space observatories being planned by the United States for launch in the next decade. With its large increase in angular resolution and sensitivity over all previous X-ray satellites, AXAF has great potential for answering fundamental questions, revealing previously unknown phenomena, and possibly discovering new laws of physics. A particularly important set of objectives is to inventory the content of galaxies and of clusters of galaxies to find out how much material of different kinds exists. The amount and nature of this material is of great importance in our attempts to understand the present state and ultimate fate of the universe.

SAO scientists have developed a novel X-ray telescope for providing high resolution images of the sun. This telescope is scheduled for test on a rocket flight in early 1988. In cooperation with Harvard College Observatory, balloon flights will also be made of another new type of telescope to observe unusual celestial sources of X-rays at much higher energies than earlier X-ray satellites could study. Results from these flights should provide important insight into the energetic processes that produce these higher energy X-rays and gamma-rays. A special flight of this payload has been scheduled for 1988 to study the recent supernova in the Large Magellanic Cloud.

SAO developed a high resolution imaging X-ray detector for flight on the West German/United Kingdom/United States Roentgen Satellite (ROSAT), tentatively scheduled for launch in early 1990, and has been working with the Goddard Space Flight Center to develop and operate the United States ROSAT data center. In this connection, SAO is developing a portable, maintainable system of X-ray analysis software, based on the Image Reduction and Analysis Facility software developed at the National Optical Astronomy Observatories and at the Hubble Space Telescope Science Institute. This X-ray software system will incorporate much of the experience gained from the Einstein satellite and should provide scientists at all institutions with the tools needed to analyze high-quality X-ray data.

Optical and Infrared Astronomy - Research in optical and infrared astronomy at SAO concentrates on the large scale structure of the universe and on the formation and evolution of stars and systems of stars. In support of this research, SAO operates the Fred Lawrence Whipple Observatory on Mt. Hopkins in Arizona, the site of the Multiple Mirror Telescope (MMT), the third largest telescope in the world, operated jointly with the University of Arizona. SAO also operates two smaller telescopes at Mount Hopkins, used for large scale surveys and for observations in support of research conducted with the MMT. In addition, there is a ten-meter-diameter light

collector, the most sensitive in the world for ground-based searches for high-energy gamma rays from celestial sources.

SAO scientists are carrying out a long-term program using the 1.5 meter telescope on Mt. Hopkins to make a three-dimensional map of the distribution of more than 10,000 galaxies within about 300 million light years of our own Milky Way. The first complete slice of this survey produced a striking map which suggested that galaxies are distributed on the surfaces of enormous bubble-like structures. The interiors of the bubbles--vast regions nearly devoid of bright galaxies--extend for more than 100 million light years, comparable with the depth of the survey. Three slices of the survey have now been completed and include more than 2,500 galaxies. The new data confirm the earlier picture developed by SAO scientists of the way galaxies are distributed on very large scales. Using the MMT, these SAO scientists have begun a deeper survey to look for even larger structures. The biggest structures pose the most serious challenge to theoretical models of the evolution of the universe. It is both exciting and sobering to think that we are drawing fundamental conclusions about the properties of the universe from maps which cover a fraction of the visible universe, comparable with the fraction of the earth covered by the state of Rhode Island! As the survey grows larger and deeper, the results are bound to prompt further profound changes in our understanding of the largest frontier--the universe itself.

How old is the universe? One way to approach this question is to look at the expansion of the universe. Most astronomers agree that the universe started with a big bang, with cosmic debris flung out in all directions from the original explosion. The time that has elapsed since the big bang can be calculated if we know how far the debris has gotten, and how fast it is moving. Another way to find how old the universe must be, is to look at the ages of objects in it, such as those of stars and clusters of stars, and to use stellar evolution theory: the universe must be at least as old as the oldest stars in it. But herein lies a puzzle, because some of the recent values for the expansion age make the universe younger than the oldest stars. Smithsonian astronomers are working on both expansion ages and stellar ages, but still do not know why they disagree. In 1987, a new way was devised at SAO for determining the ages of pairs of stars in orbit about each other, so-called binary stars. The method involves finding the orbital period that divides the binaries with shorter-period circular orbits from those with longer-period elliptical orbits. The orbits of the shorter-period ones have all been circularized by tidal friction. Theory can be used to calculate the age of a population of binary stars from observations that yield the critical period associated with the dividing line between circular and elliptical orbits. This new technique was used by SAO astronomers to date the age of the oldest binaries in our galaxy. Although the new age is still uncertain and needs to be refined by more observational and theoretical work, this first result supports the older age for the universe of approximately 15 billion years.

Planetary Sciences - Research in planetary sciences at SAO strives to provide an understanding of the planets, satellites, and small bodies of the solar system, and the processes that created them billions of years ago.

SAO scientists continue to examine the information obtained during the Voyager encounter with Uranus. Mapping of geological formations from Voyager images of the surface of Jupiter's satellite Ganymede has been completed and analysis of observations of the eclipses and occultations of the bright satellites of Jupiter is being used to study the dissipation of energy in the interior of the planet.

Although the Apollo missions ended over a decade ago, the lunar rocks continue to reveal their secrets. For example, laboratory studies at SAO of Apollo 15 rock samples revealed 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 is a continuing puzzle. The comets that approach the sun from time to time are believed to come from a halo around the solar system far beyond the orbit of Pluto. Computations by an SAO scientist suggest that as many as two-thirds of these comets may have formed in a region that extends from 1000 to 10,000 times the Earth's distance from the sun.

Although not a planetary phenomenon, the supernova in the Large Magellanic Cloud did play a large role in the activity of some Planetary Division scientists. The Central Bureau for Astronomical Telegrams disseminated several IAU Circulars every day for several weeks after the outburst, and arrangements were quickly made to relay these electronically to astronomers in many parts of the world.

Radio Astronomy and Geoastronomy - Research in radio astronomy concentrates on understanding the structure, evolution, sources of energy, and ultimate fate of the astronomical objects that emit radio waves throughout the universe. SAO scientists are pioneering the use of the radio astronomical technique of very long baseline interferometry (VLBI) to measure directly drifts among the continents and to probe the interior structure of the Earth. Other scientists 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.

SAO scientists continued a major research effort to measure the size of our galaxy and the distance to nearby galaxies. By measuring with extraordinary precision the relative motions of water-vapor masers that surround a newly formed massive star, the distance to the star can be determined. This technique was used to measure the distance to the center of our galaxy. In 1987, a new set of data was acquired to improve the accuracy of this distance determination. First epoch measurements of the motions of two maser complexes in the neighboring galaxy M33 were also made. With data taken over the course of several years, it should be possible to measure the rotation of this galaxy directly--the first time such a measurement has ever been performed.

The large-scale structure of our own galaxy is being probed by measurements of the distribution of carbon monoxide gas which radiates strongly at millimeter wavelengths. The first complete survey of molecular clouds in the galaxy was completed by SAO scientists, and led to the conclusion that in the inner part of our galaxy the amount of matter in the form of molecules is as great as the amount previously seen in the form of atomic gas.

SAO scientists found that a simple model of the energy balance in star-forming interstellar clouds can explain the size, density, and internal motions of more than 100 clouds, ranging in mass from one to one million times the mass of the sun. This model involves a typical cloud supported against its own gravity by a combination of magnetic and thermal pressures. Observational tests of the model are now under way.

Better atomic clocks are being designed and built in support of VLBI research programs at SAO and other observatories, the deep space tracking activities of NASA,

and the time-keeping program of the Naval Observatory. A novel method was developed to isolate hydrogen atoms in certain desired atomic states, which will allow improved stability in clocks. Improvements also have been made to a hydrogen maser clock cryogenically cooled to one half a degree above absolute zero. This cold clock is expected to keep time a thousand times more accurately than atomic clocks operating at room temperature.

SAO scientists have also designed a dual optical interferometer for placement in earth orbit to measure the positions of stars with an accuracy a thousand times better than can be achieved from the ground. In 1987, this project was furthered by an internal research and development program at Perkin-Elmer Corporation under which a new kind of optical element was fabricated by methods developed at SAO. This interferometer would be used to search for other planetary systems, to conduct a significant new test of Einstein's theory of general relativity, and to extend the direct measurement of distances to the cosmic scale.

Solar and Stellar Physics - Research in solar and stellar physics is directed principally towards understanding the physical processes operating in the sun and other stars. Stars like the sun are studied in order to increase understanding of the dependence of their properties on age, on composition, and on their physical associations in pairs and in groups. Research in this division includes 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.

SAO scientists used the International Ultraviolet Observatory spacecraft to obtain ultraviolet spectra of the 1987 supernova. Spectra obtained in the first hours after discovery show the outer envelope of the star lifting off through the signatures of very hot gas near the supernova that may have been caused by the initial blast of ionizing radiation on the material surrounding the star.

SAO scientists led a team that discovered periodic variations--most probably pulsations--in the bright red supergiant star Betelgeuse in the constellation Orion. Researchers had suspected that this star varied irregularly but the dedicated monitoring of its brightness by the ultraviolet satellite and by telescopes on the ground revealed a distinct 420-day period in the strength of its light. This variation appears to be the signal of a pulsating star, which would provide the answer to the long standing puzzle of how the vast extended atmosphere of this star (about three thousand times the depth of the sun's atmosphere) comes about, and how the massive stellar wind that is observed arises.

Theoretical Astrophysics - Theorists study astronomical systems by means of physical analysis and mathematical modeling. A broad range of topics is investigated, including the interiors of neutron stars, the properties of atoms and molecules in interstellar space, the formation of spiral structure in galaxies, high temperature plasmas, and the formation of planets in the early solar system.

Theoretical studies covered a wide range of topics last year, from interpretations of the first observation of neutrinos from the collapse of the core of a supernova, to the evolution of localized "inflationary universes" that might appear from the outside to be black holes. Interest in the possible existence of "cosmic strings" as artifacts of the early history of the universe has been widespread. An SAO scientist developed a model to explain how these strings, if they exist, might provide an explanation of the source of the enormous energy generated in quasars.

Another SAO scientist analyzed processes that might limit the size of the massive black hole hypothesized to lie at the center of our own Milky Way.

Other work included studies of mechanisms controlling the luminosity of gas flowing into black holes, the formation of planets, and the stability of newly formed galaxies.

Scientific Equipment Replacement and Improvement Program - With funding provided in FY 1984 and following years, SAO has been addressing its most pressing needs to replace and improve old and obsolete laboratory and computer equipment. Additional funding received in FY 1987 and FY 1988 offsets the cumulative erosion of the base for computer equipment that resulted from across-the-board reductions since FY 1985. (In accordance with the FY 1988 conference report for the omnibus continuing resolution, an additional \$250,000 will be provided for this purpose from within available Smithsonian funds.) The effectiveness of existing laboratory equipment is being substantially enhanced by microprocessor-controlled data acquisition and data presentation capabilities. A significant beginning has also been made in establishing a network for computers distributed throughout SAO. New computer workstations and their associated disk- and tape-drives are now linked together in an Observatory-wide Ethernet system. This system is allowing significant easing of the pressures on SAO's still very overloaded central computers.

Education Program - SAO conducts regular programs of public information and education, including popular lectures, "Observatory Nights for the Public" in Cambridge, and guided bus tours of the Whipple Observatory in Arizona. SAO also conceived and is leading an extensive program of development of curriculum materials for using examples from astronomy to teach the principles of science and mathematics in the Nation's high schools.

Development of Scientific Instrumentation - Beginning in FY 1989, support for the non-personnel costs for two projects for the Smithsonian Astrophysical Observatory is requested as no-year funding under the Major Scientific Instrumentation line-item: (I) the development of an array of submillimeter telescopes; and (II) the conversion of the Multiple Mirror Telescope. Both of these cutting edge scientific projects involve the fabrication of major new instrumentation that will take a number of years to plan, design and complete. The development of the submillimeter array is anticipated to continue through the mid-1990s and will require total funding currently estimated at \$30 million (FY 1987) for construction on a continental site; the cost would be about 25 percent higher if the array were located on a prime mountain site in Hawaii. The conversion of the Multiple Mirror Telescope, which might be completed as early as 1992, would require total estimated funding from the Smithsonian of \$10 million.

Facilities Development - With funding provided in FY 1988 and requested in FY 1989 as part of the Construction appropriation, a new base camp for the Whipple Observatory will be designed and constructed. A large astronomical observatory such as the Whipple requires tool shops, vehicle maintenance and storage areas, computation and drafting facilities, space for the receipt and shipment of equipment and supplies, and administrative offices, all with access to major transportation routes in order to coordinate activities in several locations. The proposed new base camp will provide space for all of these functions, as well as for displays for the public. Its facilities will include the Administrative Building and Visitor Center, with space for purchasing, fiscal, engineering and secretarial support, and for displays and briefings about the activities conducted at the Observatory; a vehicle maintenance

shop, with service and storage space to accommodate more than 60 vehicles, primarily buses and heavy machinery used for road maintenance; and a warehouse facility.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 3 workyears and \$319,000 is requested to hire a project scientist, a digital leader, and a software leader to initiate the design of a submillimeter telescope array (3 workyears and \$199,000); and to meet increased space rental costs for SAO facilities in Cambridge, Massachusetts (\$120,000).

Staffing for the Development of a Submillimeter Telescope Array (3 workyears and \$199,000) - The requested increase will allow SAO to hire a project scientist, a digital leader, and a software leader (3 workyears and \$199,000) to initiate the development of a detailed design for a submillimeter telescope array. They will study possible array sites and telescope layouts; antennas, correlators, computers, and receivers; and the cost-benefit tradeoffs associated with the designs of the individual subsystems and their integration into a functioning array. Together with the receiver leader (being hired by SAO in FY 1988), these scientists will consult with outside experts and will utilize contractors, as appropriate, to study and build system prototypes and to conduct computer simulations, all as part of this design study.

Non-personnel funding for this project is being requested as no-year funding under the new Major Scientific Instrumentation line-item; in the narrative there a full justification is given for the entire project. The personnel costs associated with the project are more suited to the SAO base and are therefore being requested here.

Research: Rent Increase (\$120,000) - For FY 1989, an increase of \$120,000 is requested to cover the annual increased space rental costs for SAO's facilities in Cambridge, Massachusetts. There are several components to this increase. First, SAO must pay its portion of the required maintenance and renovation of the Harvard College Observatory (HCO) buildings which it rents. (For example, the electrical system in one of these buildings dates from 1931 and had to undergo major renovation.) SAO's payment of its share of the cost of these renovations comes in the form of an increase in the annual lease cost per square foot of its occupancy of these buildings. After the various required maintenance and renovation projects are completed, yearly costs are projected to be \$14.28 per square foot in FY 1989, still reasonable relative to commercial leases in the area that are now in the range of \$20 to \$30 per square foot. The corresponding total increase for SAO's annual rental is \$60,800. SAO also had to accommodate the move of the Optical and Infrared Astronomy Division's instrumentation and data analysis laboratories to SAO's 160 Concord Avenue facility from the HCO buildings; the increase in the annual rental cost from this move is \$37,200. Finally, SAO must provide rental space for an instrument shelter and office and laboratory space for a world-renowned radio astronomer, newly elected to the National Academy of Sciences, who was recently recruited by SAO from NASA's Goddard Institute for Space Studies and Columbia University. His research depends vitally on a small radio telescope, which he brought with him from New York and which has been mounted on the roof of the HCO buildings. The funds needed for construction of the shelter were borrowed by HCO and, according to the usual practice, SAO's share is to be repaid over a five year period through an appropriate rental increase. Because this facility will be used a small fraction of the time by Harvard students, HCO has agreed to pay 20 percent of the total costs of this installation. The annual SAO share is about \$28,000.

If this increase is not granted, the rent will still have to be paid and the needed funds will have to be reprogrammed from base funding provided either for the non-personnel costs of SAO's research or for the computer replacement and improvement program. The rent increase amounts to about ten percent of each of these programs. Thus, lack of funding of the rent increase would have a serious, adverse effect on SAO's research activities.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - Unrestricted general funds come primarily from overhead charged on contracts and grants. These funds are used to support administrative positions and some of the other administrative costs of SAO. Special Purpose funds come primarily from two sources: external users of SAO's Computer Center and the Institution's Trust funds, with the latter providing the vast majority of these funds. The former may be used for research and computer-related purposes in future years. Trust funds provide direct support for some research as well as for the Fellowship and Visiting Scientist program, which is by far the largest single special purpose program.

Restricted Funds - Restricted funds consist of restricted endowments, as well as gifts and grants from individuals, foundations or corporations that specify funds for a particular purpose.

Government Grants and Contracts - SAO receives a majority of its funding through government agency contracts and grants for research. This research is often carried out in cooperation with both governmental and academic institutions in the United States and abroad. Funding is received from Federal agencies, such as NASA, the Naval Research Laboratory and the Air Force to support specific projects in areas of SAO's expertise. In FY 1989, possible increased funding for the High Resolution Camera for the AXAF program and for a new program, the Solar Heliospheric Observatory, could result in an increase in the Observatory's contracts. Both programs would be NASA-sponsored research.

SMITHSONIAN TROPICAL RESEARCH INSTITUTE

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	93	4,198	2	155	-	757	-	456	9	467
FY 1988 -Estimate	109	5,231	3	247	-	388	-	270	9	614
-Base	109	5,282								
FY 1989 Estimate	125	5,816	3	211	-	331	-	400	9	578

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	109	16	125
11 Personnel Compensation.....	2,718	245	2,963
12 Personnel Benefits.....	520	73	593
21 Travel.....	110	25	135
22 Transportation of Things.....	8	-	8
23 Rent, Communications & Utilities.....	32	-	32
24 Printing & Reproduction.....	23	-	23
25 Other Services.....	548	250	798
26 Supplies & Materials.....	472	125	597
31 Equipment.....	851	-184	667
Total	<u>5,282</u>	<u>534</u>	<u>5,816</u>

Analysis of Increase

Necessary Pay.....	278
Program Funds.....	256

ABSTRACT - The Smithsonian Tropical Research Institute (STRI), located in the Republic of Panama, serves as the Nation's leading international center devoted to research in tropical biology and conducts basic research in ecology, behavior and evolution. STRI's basic research programs are complemented by carefully selected applied studies with a common theme of "Alternatives to Destruction" (providing an environmentally and economically valid substitute for the traditional clearing of forest for conventional agriculture). In addition to STRI staff, scientists through-

out the world conducting research in tropical biology use STRI facilities for their fieldwork. Under the terms of the Panama Canal Treaty of 1979, STRI has been designated the custodian of the Barro Colorado Nature Monument, a 12,000-acre tropical nature preserve (consisting of Barro Colorado Island (BCI) and five adjacent peninsulas in Gatun Lake) located in the Panama Canal. Other STRI research facilities include a marine laboratory at Naos Island (on the Pacific Ocean); a marine laboratory at Galeta Point and a field station in the San Blas Islands (both on the Atlantic Ocean); and a research library, laboratories, conference and study facilities, and administrative headquarters in Panama City. STRI scientists are also engaged in collaborative research with colleagues in other tropical countries including Malaysia, India, Madagascar, Kenya, Senegal, Costa Rica, and Venezuela.

For FY 1989, an increase of 2 workyears and \$554,000 is requested to continue the development of a program in molecular evolution and plant physiology at STRI (\$400,000); to provide an expanded base for the purchase of scientific equipment (\$114,000); and to reinforce STRI's structure of essential administrative support personnel (2 workyears and \$40,000). These increases are offset by a reduction of \$298,000 in STRI's base funding associated with the one-time costs of equipping the Tupper Center (-\$184,000) and the BCI and Gamboa facilities (-\$114,000). Necessary pay of \$53,000 is required for existing staffing, along with 13.7 workyears and \$225,000 required to annualize the partial-year funding of 28 new positions approved in the FY 1988 budget.

PROGRAM - The Smithsonian Tropical Research Institute, the Nation's leading international center for the advancement of basic research in tropical biology, performs at least four major functions as it strives to expand the horizons of tropical biology: 1) conducts fundamental research on the ecology, evolution and behavior of tropical plants and animals, including mankind; 2) provides major facilities for the international scientific community to study both terrestrial and marine tropical biology; 3) is deeply committed to environmental education and to conservation of tropical ecosystems; and 4) has the treaty-assigned responsibility to protect and manage the Barro Colorado Nature Monument.

Growing public and governmental concern over the impact of tropical deforestation and species extinction on the economic well-being of the United States, as well as in the tropical regions more immediately affected, has stimulated numerous public and private sector actions. Conversion of tropical forest to scrub and grassland appears to affect global, as well as regional climatic patterns, and may adversely affect the North America environment. Species loss forever eliminates potential sources of medically and commercially important natural products. The basic research conducted at STRI provides the essential framework for effective management and conservation of tropical ecosystems. Educational programs at STRI improve the transfer of this knowledge to those who will develop and implement management and conservation plans. Current research projects are summarized in an annual report and in STRI Contributions to Research, an offprint of STRI publications, which are distributed to appropriate organizations throughout Panama and the rest of the world. During FY 1987, the most significant accomplishments and major program activities have been:

Experimental Analysis of Forest Dynamics - Barro Colorado Island is unique among tropical field stations with respect to the amount and quality of logistical and technical support provided to STRI staff and distinguished visitors from numerous universities and research institutes. This makes it possible to carry out sophisticated, large scale and long-term experimental studies that would normally be

impossible in a tropical forest. Such experiments are necessary to rigorously determine how environmental factors affect forest dynamics.

STRI is now in the third year of a major experimental study of how seasonal drought affects growth and reproduction of forest trees and understory plants. Two tracts of forest have been irrigated during the annual dry season to maintain wet season soil moisture levels, and these tracts have been compared with non-irrigated controls. A major finding is that many species do not respond significantly to increased soil moisture during the dry season, contrary to expectation. This suggests that variation in day length and relative humidity, as well as soil moisture, may be playing significant roles in controlling seasonal patterns. These results will have great practical importance as they provide insight necessary for development of guidelines for tropical agro-forestry schemes utilizing native tree species.

STRI scientists and collaborators are completing the fifth year of an experimental study of how seasonal and year-to-year variation in light affect growth, reproduction and distribution of forest plants. New computer image processing technology is being used to analyze the forest light environment, permitting extensive measurements in a few hours which would previously have required several weeks. Increased leaf fall and insolation in the dry season, combined with frequent tree falls and branch falls create a forest light environment that is strikingly variable in time and space. Experimental studies in the forest and in the BCI plant physiology laboratory demonstrate that this variation in light regime can explain much of the observed variation in growth and reproduction of canopy tree seedlings and understory species.

Biological Diversity - The origin and maintenance of the great species richness in the tropics is a fundamental research emphasis at STRI. One important, long-term component of this program is the 124 acre forest census on Barro Colorado Island. STRI researchers supervise the mapping and measurement of over a quarter of a million trees on the site every five years. Support for this critical project has been assured by funding received in the FY 1987 budget.

Excellent progress is being made on an identical research project in the more species-rich forest of Malaysia. A STRI researcher and a researcher from Harvard University are collaborating closely with their Malaysian colleagues. Long-term comparisons of the dynamics of these two forests will contribute significantly to understanding the factors responsible for variation in species richness. These studies also provide information of great practical value to foresters on the growth requirements of commercially important native species.

Biological Catastrophes - STRI's long-term basic research programs provide a context for evaluating environmental catastrophes. A major oil spill occurred in April 1986 at STRI's Galeta Marine Lab on the Atlantic coast of Panama, significantly affecting marine and intertidal communities. STRI has just signed a five-year \$3 million contract with Minerals Management Service of the Department of the Interior to investigate the impact of the oil spill on biological communities. STRI is coordinating an international team of over a dozen scientists to relate the recovery of biological communities in areas affected by the spill to natural population variation prior to the spill.

Biological Conservation - Protection and management of biological diversity is the primary goal of the emerging discipline of conservation biology. Although not called by that name, many STRI research programs directly relate to this goal. For

over ten years, a STRI scientist has been capturing and banding birds in the forests of Soberania National Park adjacent to the Barro Colorado Nature Monument. As has been demonstrated on islands throughout the world, the isolation of Barro Colorado Island was followed by local extinction of many bird species. Study of birds banded in Soberania show that species that have disappeared from the Island have lower survivorship on the mainland than species that are still present on the Island. This is the first demonstration of a demographic parameter being closely linked with extinction probability on an isolated island, a result that is of major interest in conservation biology.

Molecular Evolution and Plant Physiology Initiative - With funding provided in the FY 1988 budget, STRI is establishing a research program in molecular evolution and plant physiology. While STRI scientists have always made some use of molecular and physiological techniques, the ability to carry out major research in these exciting fields was significantly enhanced by this support. Studies of molecular evolution will permit STRI scientists to address basic questions concerning the processes of speciation, maintenance of genetic variation in populations, and the nature of population differentiation. Studies of tropical plant physiology provide essential insights into the nature of plant adaptation to environment information necessary to apply basic knowledge to the urgent problems of forest conservation and management.

Visiting Scientists - In addition to the research by permanent staff, the Smithsonian Tropical Research Institute promotes basic research in tropical biology by hosting several hundred students studying in association with the staff and visiting scientists from many countries. Research goals can be pursued in biologically rich environments without concern for intellectual isolation. Hundreds of scientists from major universities and research institutions from most states of the United States and from all over the world ensure a continuing infusion of new ideas leavened by the long experience in the tropics of STRI's permanent staff.

During FY 1987, a paleobotanist from Temple University continued research on the vegetational and human history of Central Panama during the past 14,000 years. Rigorous analyses of plant remains in sedimentary deposits of known age have revealed that initial human occupation of the Isthmus of Panama, which occurred at least 13,000 years ago, took place during cooler, drier conditions than existed from 9,000 years ago to the present. Evidence of agriculture has been found in Central Panama as early as 7,000 years ago (the oldest evidence of maize and squash cultivation yet found in lower Central America and South America) and evidence of extensive deforestation beginning 3,000 years ago, associated with increased agricultural activity.

Publications - At least 177 scientific papers and books were published during calendar year 1986 as a result of work at STRI. Staff and visiting scientists are currently involved in over 144 research projects which will produce at least the same number of publications.

Facilities - STRI's research facilities in Panama include the Barro Colorado Nature Monument, marine laboratories at Naos Island and Galeta Point, a small field station in the San Blas Islands, and a cloud forest station at an elevation of 6,500 feet in western Panama. STRI also operates a 63-foot research vessel for studies in both the Atlantic and Pacific Oceans. Since STRI's research programs include both comparative studies among habitats and geographic regions, and numerous carefully organized experimental studies, these facilities are also used as the home base for research conducted at numerous other sites throughout Panama.

Ground breaking for the new Tupper Laboratory and Conference Center took place on April 3, 1987. This new facility will provide office, laboratory, and conference facilities for STRI scientific staff and visiting scientists. The laboratory will provide modern facilities similar to those at major research universities, and will support development of plant physiology and molecular evolution programs at STRI. By December of 1987, considerable progress had been accomplished and completion of the facility is scheduled for September 1988. The renovation of a building for use as a dormitory in Gamboa was completed in August 1987. This will facilitate research in Soberania National Park.

Plans have been completed for the new dormitory, kitchen and dining hall on Barro Colorado Island. This will provide modest living facilities for the large number of researchers who use BCI. Construction will begin with the onset of the dry season in the winter of 1988. In addition, funding is requested as part of the Institution's FY 1989 Construction appropriation to build a new laboratory facility, a vivarium, an insectary and a growing house on BCI.

Fellowships, Conservation and Environmental Education - Because of its location in the Republic of Panama, STRI is in a unique position to play a significant role in the study and conservation of tropical environments. The goals of STRI in the area of education are two-fold: first, STRI is interested in the development of creative scientists from tropical and nontropical nations; and second, STRI is committed to the conservation of tropical ecosystems and is aware that their survival depends on the combined efforts of international organizations, governments, the private sector, and people in the tropical countries themselves.

Approximately 91 young men and women (40 from Latin America) representing a dozen nations participated in STRI's academic programs in FY 1987. Also, STRI and the University of Panama organized a graduate-level course in bryophyte ecology and systematics.

STRI's educational function in tropical biology is enhanced by its premier reference library for tropical studies. This library serves STRI's staff, visiting scientists and students from secondary schools and universities in Panama. Currently, the library has over 1,000 patrons per month.

STRI is deeply involved in conservation activities in the Republic of Panama. STRI works actively with Asociacion Nacional para la Conservacion y la Naturaleza, a newly formed local affiliate of the Nature Conservancy, in its efforts to purchase and protect endangered natural areas. STRI also provided financial and logistical support for the planning of the major new Darien National Park. Intensive studies of green iguana and paca management are providing protocols for the eventual use of these species as a standard component of Panamanian agriculture. Studies of fast-growing plantation trees and new crop plants are in progress on the mainland west of Barro Colorado Island to provide local farmers with sustained-yield agricultural techniques that eliminate the need to continually remove forest to provide new crop land.

Although the primary emphasis of STRI continues to be basic research, its understanding of tropical organisms and environments deepens and broadens over time, improving its ability to apply this knowledge to the increasingly serious environmental and economic problems confronting the Republic of Panama and other tropical countries. At the same time, STRI's educational programs are producing both greater interest in the application of basic knowledge to applied problems among

students in the tropics, and greater expertise among these students, so that they will be better able to address such problems.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 2 workyears and \$554,000 is requested to continue the development of a program in molecular evolution and plant physiology at STRI (\$400,000); to provide an expanded base for the purchase of scientific equipment (\$114,000); and to reinforce STRI's structure of essential administrative support personnel (2 workyears and \$40,000). These increases are offset by a reduction of \$298,000 in STRI's base funding associated with the one-time costs of equipping the Tupper Center (-\$184,000) and the BCI and Gamboa facilities (-\$114,000).

Molecular Evolution and Plant Physiology Program (\$400,000) - The application of molecular and physiological techniques to ecological and evolutionary problems is dramatically altering and strengthening science's understanding of life on Earth. This understanding is essential to effectively conserve and manage tropical forest and marine resources--now severely jeopardized by human pressures. Molecular techniques provide essential information on genetic structures of endangered plant and animal species. This is important in the design and management of tropical forest and marine preserves: if the preserves fail to incorporate adequate genetic variability, the probability of species extinction is increased. Physiological techniques provide information on how species adapt to seasonal drought, heat, nutrient starvation, disease and related stresses common in tropical forests. This knowledge is essential in forest management, reforestation and agro-forestry. In order to maintain its leadership in tropical biology, STRI must increase its expertise in these critical areas. No other institution in the tropics is carrying out rigorous research on molecular evolution and physiology in marine and terrestrial habitats. The STRI program fills a major gap in this field, and will serve as an international center for research and training. With funding provided in FY 1988, STRI began to establish a molecular evolution and plant physiology program, develop laboratories with up-to-date equipment, and expand its professional and technical support staff to study genetic variation and physiology of tropical organisms.

However, during FY 1988 Congressional action, funding for several important aspects of program support for these programs was reduced. The long-term effect of these reductions would be to seriously undermine STRI's ability to employ the newest technologies and theoretical advances in these disciplines. To provide adequate funding for this new high priority research program, additional funding of \$400,000 is requested for FY 1989. This funding will ensure essential research support in the crucial and rapidly developing field of plant physiology, to further strengthen the research program in molecular evolution, and to provide the necessary scientific infrastructure of technical support, laboratories and specialized equipment for both these areas. In addition, this funding will allow for critical equipment maintenance to ensure that these instruments function in peak operating condition, particularly crucial in a tropical environment. The requested increase will be used to provide stipends for post-doctoral fellows, to contract for maintenance for specialized equipment and other technical services, purchase laboratory chemicals, glassware, calibration gases and other scientific supplies and support the travel costs of STRI researchers in the field.

Scientific Equipment Acquisition and Replacement Program (\$114,000) - The condition of research equipment at the Institution's science research bureaus has been a source of concern for a number of years. Many pieces of research equipment have become outmoded by recent technological developments. The productivity of Smithsonian

research staff, especially new members trained in the use of modern equipment, has been severely impaired by the condition of this equipment. Prior to FY 1984, equipment needs, particularly major items, were addressed only on an ad hoc basis. Beginning in FY 1984, the Institution began to address these problems through a systematic review of inventoried equipment in each of the science bureaus. The results of this systematic review dramatically outlined the poor state of the Institution's research equipment, and the need to develop a rigorous cyclical program for replacement and upgrading. Recognizing the age of the many pieces of equipment, the Institution perceived a need to develop a cyclical replacement schedule for equipment.

For STRI, the necessity for establishing an adequate funding base for a long-term cyclical program of scientific equipment replacement and upgrading is underscored by its geographical location and climatic conditions. STRI's relatively isolated location combined with the harsh tropical climate require more frequent replacement of certain equipment and the need for back-up systems to ensure continuous operation. STRI's current base of \$100,000 cannot fully support the scheduled replacement and upgrading of scientific equipment as required under the cyclical program. For FY 1989, an increase of \$114,000 is requested to establish an expanded base of \$214,000 for this program. (Increased funding for this program is offset by a reduction in STRI's base funding associated with one-time equipping costs for the new BCI and Gamboa facilities. It is anticipated that additional funding for this program will be requested in FY 1990, offset by a reduction in base funding associated with the second portion of one-time equipping costs for the Tupper Center.)

Staffing for Administrative Support (2 workyears and \$40,000) - The growing administrative responsibility resulting from increased numbers of visiting researchers and the general growth of research programs at STRI have placed a heavy burden on the existing administrative support staff at STRI. Because of STRI's remote location, it must be more self-reliant with respect to administrative support than Smithsonian bureaus located in the United States. Research at STRI is becoming more experimental and technically complex, further adding to the demand placed on support staff. During the period from FY 1985 through FY 1987, STRI experienced over a 25 percent increase in the amount of purchases and financial transactions made to support the scientific community at STRI without a concomitant increase in administrative support personnel. Two major multi-year grants to STRI from non-Smithsonian sources (the W. Alton Jones Foundation grant for agro-forestry research and the Minerals Management Service of the United States Department of the Interior grant for the oil spill study) have greatly increased the workload of the Accounting department. Thus, steps must be taken to catch up in administrative personnel to properly service the administrative needs of the research programs. For FY 1989, funding is requested to hire an accounting technician and a secretary (2 workyears and \$40,000).

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from a variety of sources including receipts and collections from users of Barro Colorado Nature Monument facilities (20 U.S.C. 79b (d)) and annual allotments. Such funds are used to support, in part, the salaries and related costs of the fellowship program, the senior sabbatical program, insurance, supplies, and a long-term collaborative research program with the Forest Research Institute in Malaysia. As a result of the United States Ambassador's directive banning the use of the Panama railroad for official purposes, funding was provided at the end of FY 1986 for the purchase of a high speed vessel to transport personnel to Barro Colorado Island; this boat was put in service

by November 1987. Funds also are used to support a short-term fellowship program in tropical biology; visiting scientists and students; field research; seminars and lectures; environmental, conservation and education activities in Panama; and to defray expenses at international scientific colloquia and ceremonial occasions.

Restricted Funds - Funds are in the form of restricted endowments which specify the use of the donation or bequest and gifts and grants from individuals, foundations, organizations, or corporations for specific purposes. These are used to support scientific research related to the biological, ecological and behavioral processes on which tropical ecosystems are organized; research related to geophysical events; publication and distribution of research results; and studies relating to endangered tropical environments.

Continuing support from the Exxon Corporation will be used to provide short-term tropical biology fellowships and assistance to 30 students from developing Latin American countries.

A grant awarded by the W. Alton Jones Foundation, Inc., supports research on the management of the green iguana for human consumption and the domestication of the paca as a food source. These projects are designed to develop alternatives to the destruction of tropical forests for conventional agriculture (particularly extensive cattle rearings) and have been conducted over a five-year period in the vicinity of the Barro Colorado Nature Monument; the project will end during FY 1988, unless additional funding can be raised.

Government Grants and Contracts - A \$3 million contract was signed with the Minerals Management Service of the United States Department of the Interior in June 1987 to permit a five-year study of the catastrophic oil spill at the Galeta Field Station.

SMITHSONIAN ENVIRONMENTAL RESEARCH CENTER

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	28	1,960	1	77	-	91	-	17	-	418
FY 1988 -Estimate	28	1,373	2	99	-	102	-	35	-	405
-Base	28	1,386								
FY 1989 Estimate	28	1,397	2	100	-	102	-	-	-	351

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	28	-	28
11 Personnel Compensation.....	666	8	674
12 Personnel Benefits.....	84	3	87
21 Travel.....	10	-	10
22 Transportation of Things.....	2	-	2
23 Rent, Communications & Utilities.....	10	-	10
24 Printing & Reproduction.....	6	-	6
25 Other Services.....	130	-	130
26 Supplies & Materials.....	194	-	194
31 Equipment.....	284	-	284
Total	<u>1,386</u>	<u>11</u>	<u>1,397</u>

Analysis of Increase

Necessary Pay.....	11
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ABSTRACT - The Smithsonian Environmental Research Center (SERC) performs basic scientific research on coastal land/water systems. SERC currently occupies 20,000 square feet of laboratory, office, educational, and support buildings and 2,600 acres of land on a tidal river system. The interdisciplinary staff, visiting scientists, and students study how land use, air quality, and weather variations affect (a) the

movement of nutrients, eroded soil, and other materials through the system (b) the dynamics of plant and animal populations and (c) the overall health of the system. No increase is requested for FY 1989. Necessary pay of \$11,000 is required for existing staff.

PROGRAM - SERC research has the goal of attaining a better overall understanding of how coastal land/water environmental systems function. Research staff address a wide variety of ecological questions while conducting a long-term interdisciplinary study of a tidal subestuary of Chesapeake Bay (Rhode River) and its watershed. This watershed contains a mosaic of upland and floodplain forests, marshlands, cropland, pasture, abandoned fields, and residential areas typical of the mid-Atlantic Coastal Plain. This land/water system is used as a testing ground for theories that have broad applicability and for environmentally relevant issues. The Center has already studied such problems as (a) effects of herbicides on plants in Chesapeake Bay, (b) acid rain effects upon deciduous forest and fish reproduction, and (c) the role of riparian forests in alleviating pollution from agriculture. The similarity of the Rhode River system is directly tested by comparative studies of other systems.

Research Results - Streamside or riparian forests play an important role in intercepting pollutants from developed or agricultural uplands before they enter streams on the watersheds of the Chesapeake. SERC has now established detailed hydrologic budgets for these forests. Over a two-year study period, 62 percent of the rainwater and cropland runoff which entered the riparian forest was evaporated or transpired. This averaged eight centimeters more per year than the total precipitation. This study also found that over 90 percent of the acidity in cropland runoff was neutralized within the riparian forest. Partial funding of this work was undertaken with support of the Institution's International Environmental Science Program.

Carbon dioxide concentrations in the Earth's atmosphere have recently been increased (approximately one-half percent per year) and are anticipated to double over current levels within the next century. SERC scientists are testing the effects of a doubling of the carbon dioxide concentrations on Chesapeake Bay tidal marsh plant communities. Long-term effects upon competition between species with differing ability to utilize the increased concentrations of carbon dioxide are anticipated. Thus, plants such as sedges may be able to displace grasses such as Spartina patens altering the overall character of the marsh plant communities. In addition to its impact upon photosynthetic rates, elevated carbon dioxide was predicted to cause the plants to require less water and to, therefore, reduce their level of salt stress. This prediction has already been confirmed in field populations. Such secondary effects of elevated carbon dioxide may ultimately bring about unanticipated ecological effects. For this reason, direct experimental studies of ecological effects at the plant community or ecosystem level are necessary if we are to anticipate long-term effects of the increasing concentrations of atmospheric carbon dioxide. This project is partially funded by the U.S. Department of Energy.

For several years, studies of blue crab ecology have focused upon their behavior and population dynamics in the Rhode River. Abundances, size-frequency distributions, sexual composition, and molt-stage composition were studied. New crab recruits entered the subestuary in late autumn and spring and grew rapidly to 70 to over 100 millimeters in their first summer; by the second year they reached mature sizes of 120 to 170 millimeters. Sixty percent of crabs in the river basin were males; and after maturation and copulation in late summer to early autumn, mature females left the subestuary. Crabs partitioned habitats within the Rhode River subestuary by size,

sex, and molt stage. Polymodal size structures were similar throughout the river basin, but increased percentages of males were found at the head of the river. Predominantly (90 percent) medium-sized (80 to 120 millimeters) males utilized the tidal creek as a molting habitat. Most crabs moving upstream were in premolt, whereas most crabs moving downstream were significantly larger and in postmolt, so that about 70 percent of crabs in the creek were near ecdysis. Males and females exhibited significantly lower, but still appreciable (about 25 percent) molting activity throughout the river basin. These data provide one of the best documented cases of habitat partitioning by size, sex, and molt stage in crustaceans.

Blue crabs are major predators on Chesapeake Bay benthic animals such as soft-shelled clams. How do adult soft-shelled clams persist at low densities in Chesapeake Bay sandy habitats despite intense predation by blue crabs? This persistence may be a consequence of variation in blue crab foraging rates as a function of clam density and sediment composition. In laboratory aquaria, the functional responses (prey consumption per predator as a function of prey density) were studied of large blue crabs to six densities of adult soft-shelled clams buried at natural depths in two sediment types (mud and sand). Functional responses in sand and mud were differentiated statistically and modeled. Crab predation rates were significantly higher in mud than sand, and functional responses differed significantly between these two substrata. Blue crabs displayed type III (sigmoid) density-dependent functional responses in sand and type II (decelerating rise to an upper asymptote) inversely density-dependent responses in mud. Risk of mortality for clams decreased sharply in sand at low densities. These observations (1) suggest that variable blue crab functional responses result in microhabitat-specific mortality rates of benthic prey, and (2) indicate that functional response can differ significantly according to the physical properties of topographically simple habitats.

Ants are well known to be important and abundant links in the terrestrial food web. A study of the ant populations in the litter and soil of a mature forest on the Rhode River watershed in Maryland found 22 species to be present. The ten most abundant species accounted for more than 95 percent of the individuals collected. The density of ants per unit of surface area was more than three times as high in the upper ten centimeters of soil as in the overlying litter. Seasonal differences in ant abundance and community composition were significantly correlated with surface temperature and were largely independent of substrate moisture content and standing crop of leaf litter. Ant density and biomass were high, rivaling previous values reported from tropical forest ecosystems.

Educational Activities - SERC provides a broad range of educational activities, including teacher-led field trips, self-guided nature trails, and guided tours in which groups of students and the general public observe firsthand a variety of natural habitats. A work/learn program enables students to work with scientists, both in the field and in the laboratory. Predoctoral, postdoctoral, and sabbatical programs for professionals at all levels enable visiting researchers to carry out collaborative or independent research at SERC. The results of SERC's research are disseminated through the publication of findings in scientific journals, the presentation of research findings at national and international scientific meetings and seminars, the training of scientists, and public education activities.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are provided by allotments and proceeds from the sale of educational brochures and materials. Uses include

support of special events, work/learn and fellowship programs, and the salary costs of a docent coordinator and a public program director.

Restricted Funds - These are provided through donations, bequests, and foundation grants that are designated for specific subjects of investigation. For FY 1988, a grant from the World Wildlife Fund continues to support investigation of the effects of land use changes in the Yucatan Peninsula upon migratory bird populations which nest in the Chesapeake region and winter in Mexico.

Government Grants and Contracts - These funds are provided by various Federal and State agencies for special projects which can be conducted at SERC utilizing the expertise of the staff and the unique physical site characteristics. A grant from the Chesapeake Research Consortium supports research on the nutrient dynamics of the Rhode River system while a grant from the U.S. Department of Energy furthers the study of greenhouse effects on marshes.

NATIONAL ZOOLOGICAL PARK

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	314	12,372	1	138	-	408	1	179	-	50
FY 1988 -Estimate	329	12,979	1	132	3	450	1	923	-	96
-Base	329	13,143								
FY 1989 Estimate	342	13,890	1	134	3	406	1	872	-	59

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	329	13	342
11 Personnel Compensation.....	9,210	415	9,625
12 Personnel Benefits.....	1,343	126	1,469
21 Travel.....	41	-	41
22 Transportation of Things.....	10	-	10
23 Rent, Communications & Utilities.....	54	-	54
24 Printing & Reproduction.....	15	-	15
25 Other Services.....	442	-	442
26 Supplies & Materials.....	1,513	137	1,650
31 Equipment.....	510	69	579
41 Grants.....	5	-	5
Total	<u>13,143</u>	<u>747</u>	<u>13,890</u>

Analysis of Increase

Necessary Pay.....	226
Program Funds.....	521

ABSTRACT - In its 1889 charter, the mission of the National Zoological Park (NZN) was defined as "the advancement of science and the instruction and recreation of the people." Today these goals are accomplished through programs that make the National Zoological Park a leading international center for animal exhibition; biological and veterinary research; conservation; and public education in conservation and in the humane care of animals. The Zoo houses its public collection on a 163-acre site at

Rock Creek Park in Washington, D.C., and maintains a major conservation, animal breeding and research center on 3,150 acres in Front Royal, Virginia. Through its programs in research, conservation, animal health and education, the Zoo serves the public and specialized audiences in promoting understanding of animal adaptations and evolution, and the interaction of wildlife with the environment. For FY 1989, an increase of 10 workyears and \$521,000 is requested to support existing facilities at the Zoo (8 workyears and \$327,000), and to support the molecular systematics and evolution program at the National Zoological Park (2 workyears and \$194,000). Necessary pay of \$157,000 is required for existing staff, along with 2.75 workyears and \$69,000 required to annualize the partial-year funding of 11 new positions approved in the FY 1988 budget.

PROGRAM - At its Rock Creek site, the National Zoological Park (NZP) is responsible for the maintenance and welfare of approximately 3,000 animals comprising over 450 species. The species are chosen primarily for their interest to the public as well as their contribution to research and conservation. About 700 animals, representing 43 species, located at the Conservation and Research Center (CRC) at Front Royal have been selected, due to their precarious status in the wild, to form the basis for long-term breeding and research potential.

The major programs of the National Zoo are animal exhibition; animal management; animal conservation and propagation; research; and public education information. In addition to its leadership role in animal management practices, the Zoo plays a major role in developing new techniques for long-term sperm and embryo storage and embryo transplantation. These techniques will likely play a crucial part in future conservation objectives. Many species are endangered due to man-made disturbances to their natural habitats, which is particularly true today in the tropics. For this reason, the Zoo has an energetic program of conservation research in the natural habitats of endangered species and is conducting pioneering studies in the reintroduction of animals bred in zoos to their native habitat. The Zoo is also developing programs on the role both the public and zoos can play in animal conservation.

Animal Exhibition - Animals are exhibited primarily to excite the Zoo visitor about biology and the natural world. The National Zoo is rapidly transforming its principal focus to a BioPark by shedding traditional distinctions between plants and animals, aquatic and terrestrial life, vertebrates and invertebrates, and even science and art. Ecological holism requires that the separation of aquariums, botanical gardens, natural history and art museums, and zoos be reduced considerably. The resulting BioPark will emphasize the inter-relationships between plants and animals, living and extinct organisms, water and land, form and function. The influence of man on nature, including domestication, agriculture, hunting, art and environmental impact will be featured.

The Invertebrate Exhibit at the Zoo, opened in 1987, began the process toward the BioPark concept. Here, the animals without backbones, from sponges to octopuses that make up 99 percent of the animal kingdom are shown in authentic and elegant settings.

A new exhibit for gibbons, located on a wooded ridge in Rock Creek, is to be opened this spring. This will form an appropriate stage for their spectacular locomotion and territorial calling. The graphics and plantings will be restful, understated and organic reminders of the Asian origins of these very endangered forest apes.

Renovation of the waterfowl wetlands in front of the Bird House began in July. It is a naturalistic, contemplative setting that will this spring come alive with the elaborate courtship rituals of a wide variety of ducks, geese and swans.

Of particular note, is the emergence of a conceptual plan for the Amazonia Aquatic Exhibit, the first phase of the new aquatics complex. The Amazon is the most diverse freshwater habitat in the world in species numbers, hydrology and ecology. It is almost totally interlinked with the rain forests through which it flows. A very substantial part of the foods for the extraordinary array of Amazonia fishes comes directly from the surrounding, overhanging and enclosed forest. Thus, an Amazon exhibit is inevitably also a forest exhibit and that means it draws from the flora and fauna of the largest continuous area of forest in the entire world and an unparalleled diversity of life.

There is another input into this exhibit that will make the design process seminal and the final product unique; that is the unrivaled expertise of the Smithsonian among its various bureaux in the field of tropical biology. The exhibit, sited at the former polar bear enclosure, will display a wide variety of aquatic animals concentrating on fishes but including seldom seen amphibians, reptiles, birds and mammals with above and underwater viewing. Among the aquatic animals currently under consideration for the aquatic component are giant otters, snakebirds, freshwater sharks and hundreds of species of Amazon fishes.

Orangutan, giraffe, saurus cranes, small-clawed otters, golden-headed tamarins and cuttlefish were among the nearly 1,000 births and hatchings that in 1987 bolstered stocks of threatened species and delighted visitors. An infant giant panda riveted the American public for 72 hours before its sad and sudden death; plans are already afoot to improve the panda's breeding potential and cub survivability. The likelihood of a gorilla birth at NZP was enhanced by the successful formation of a naturalistic group. Two young, female, great one-horned rhinoceros were presented to the National Zoo by the King of Nepal as a symbol of a long-standing successful collaboration between the Smithsonian and Nepal to save the Chitwan National Park. It is the Institution's hope that these animals will eventually form the core of a breeding program for this rare and beautiful species. One Patagonian hare (mara), Japanese giant spider crabs, camels, Mississippi river fish, free-ranging golden lion tamarins, beavers, star-nosed moles, and pheasant pigeons, among others, were added to the exhibit program.

Animal Management - Of prime importance is the health and well-being of the animals under the Zoo's care. The Zoo attempts to provide the animals with natural and congenial conditions which contribute to the overall state of health and a general absence of stress. In addition, the National Zoo provides the most advanced techniques in health care, preventive medicine, emergency treatment, surgery, dentistry, and neonatal medicine. As part of the medical program, the Zoo has a pathology staff that provides in-house diagnostic support for the collection and engages in research related to disease prevention. The medical care is reinforced by a scientifically based nutrition program and the highest standard of food preparation. Comprehensive medical and general records, the majority of which are automated, are maintained on all animals.

The medical case load is now about 3,000 cases per year with approximately 700 hospitalized patients. In addition to the hospital at Rock Creek, the new Conservation and Research Center hospital is now functioning. Animals have been quarantined at this facility and major surgical procedures are performed in the

surgery suite. The associated laboratories are being utilized for urinary hormone analysis, semen freezing, antibiotic assays, and clinical pathological studies.

The new hospital at Rock Creek, which will enhance medical and surgical care plus provide necessary laboratories for applied clinical and reproductive research, is scheduled to open April 1988. Additional funding will be required to equip this facility so the NZP will have the state-of-the-art facilities for its animals.

During 1987, the Zoo made major advances in the field of reproductive physiology and endocrinology. The year began by the establishment of the Endocrinology Research Laboratory in the new veterinary hospital complex at the Conservation and Research Center. This laboratory's research is oriented towards monitoring hormonal metabolites in voided urine, an ideal non-invasive approach to studying endocrinology of wildlife species in zoos. This technique has already been successfully used to diagnose pregnancy and length of the reproductive cycle in Eld's deer and the Przewalski horse and studies are in progress involving Pere David's deer, muntjac and golden lion tamarins.

Various Department of Animal Health staff members served as reproductive consultants on the black-footed ferret propagation program coordinated by the state of Wyoming. The Zoo also served a research role by studying the efficiency of artificial insemination in Mustilidae, using the domestic ferret as a model for its black-footed relatives. Over one hundred domestic ferrets were produced using a new laparoscopic artificial insemination technique.

Of particular significance was the In Vitro Fertilization Research Program in domestic cats in which eggs were laparoscopically recovered from females and mixed with sperm in the laboratory to produce embryos. These embryos were transferred to the reproductive tracts of six surrogate mother cats resulting in five pregnancies and the birth of ten healthy kittens. The technology associated with these, the first ever "test tube kittens," will have applications to many endangered carnivores. Embryo transfer studies are ongoing with scimitar-horned oryx and bongo at the Conservation and Research Center and collaborating zoos in the United States.

Animal Conservation and Propagation - The Conservation and Research Center continues to play a leading role in research and breeding programs for rare and endangered species. The Center's facilities provide a unique environment for breeding selected species such as Przewalski horses, Burmese brow-antlered and Pere David's deer, maned wolves, clouded leopards, lesser pandas, Matschie's tree kangaroos, Guam rails, Micronesian kingfishers, red-crowned and white-naped cranes, and several others. Most of these breeding programs entail considerable cooperation with national and international agencies and institutions. The Zoo will continue its active leadership role in a variety of national cooperative breeding programs, such as those for the golden lion tamarin, gorilla, orangutan, small-clawed otter, and Bali mynah.

The Center is also an important training ground for the wildlife management and training curriculum, which is taught to nationals of developing nations. Nearly 200 students from South America, Africa, and Asia have participated in this unique course at Front Royal, and a similar number of students have attended the course in Sri Lanka, Peru, Venezuela, and other third world locales. In 1987 the course was given for the first time in the People's Republic of China. In addition, a new zoo animal management training course was given by zoo personnel in Thailand and Malaysia. This course provides much-needed fundamental training in zoo animal management to mid-level zoo personnel in developing nations. The Zoo will continue its highly successful

ongoing training programs for United States students in the areas of veterinary medicine, pathology, animal behavior, and animal management.

The National Zoo is actively promoting conservation in the wild. In 1986 and 1987, the National Zoo's research team in Nepal (the Smithsonian Institution-Nepal Terai Ecology Project--SINTEP), assisted in the translocation of 13 one-horned Asian rhinoceros from Royal Chitwan National Park to Royal Bardia Wildlife Reserve in Nepal. Other reintroduction programs for Eld's deer, Guam rails, and Bali mynahs are underway or are to be carried out in the near future.

Animal propagation requires a high degree of cooperation between zoos. Animals must be transferred between zoos for demographic and genetic management, and a number of animals have been delivered to foreign zoos. The Zoo continues to explore opportunities to place rare and important species in zoos outside the United States to promote reproduction, public education and zoological interest. For example, the Zoo transferred a pair of Eld's deer to Thailand in late 1987 to commemorate the 60th birthday of the King of Thailand. This gesture is also relevant to breeding and reintroduction programs in which the NZP scientists are assisting for this endangered species. Five endangered species are being managed on a national or international scale by Zoo staff.

The Conservation and Research Center may become the recipient of a breeding group of black-footed ferrets in 1988. This severely endangered species of the Great Plains has been the focus of intensive conservation efforts by Federal agencies. The Zoo's breeding center was considered by experts to be the most competent facility to deal with the propagation and research challenges of this species, but supplemental funding will be required to support this crucial project.

Research - The success of the NZP programs in conservation and propagation depends largely upon the Zoo's ongoing research. The reintroduction of the golden lion tamarins to the wild would not have been possible without sophisticated and painstaking research. With little prior knowledge, Zoo researchers had to study in great detail the structure of the social and family life of tamarins before they could successfully breed them and, ultimately, re-create natural groups of animals capable of surviving in the forests of Brazil. Zoo studies are now emphasizing a variety of approaches to improve our understanding of the ecology of the golden lion tamarin for application to its conservation. The National Zoological Park's field ecology program on golden lion tamarins in the Poco das Antas Reserve (Brazil) is now focusing on in-depth examination of the mating system and social organization of this species so that scientists can predict how and why the future population might expand.

The golden-headed lion tamarins, a new acquisition in 1986, are reproducing well, with three surviving litters in the first year. Once long-term propagation is assured for this species, the Zoo hopes to start a research and release program in Brazil comparable to what has been accomplished with the golden lion tamarins.

In general, research at the Zoo concentrates on understanding the factors that influence the biology and behavior of both species and individuals. One major area of interest is in growth; studies focus on the natural patterns of development of different species in order to determine the ontogenetic and evolutionary basis for species differences in adult behavior. For example, studies of how certain bird species learn to find and feed on the correct foods illuminate how inborn behavioral tendencies are channeled into the appropriate adult response. One application of

these studies of learning is the training of zoo adults and young for survival in the wild.

A major focus of research at the National Zoo is on genetic studies. Various studies being conducted, in conjunction with other zoos around the world and with the National Cancer Institute, are expected to contribute to the long-term viability of zoo populations of critically endangered species. Automated demographic models and long-term breeding plans are being developed for zoo populations of tigers, Asiatic lions, and golden lion tamarins. Efforts to determine the pedigrees of several hundred zoo bred endangered Bali mynahs were started prior to establishing discussions concerning the potential for a reintroduction program for this species in Bali, Indonesia. The Zoo's genetics specialists are advisors to numerous international programs for endangered species, including California condors, black-footed ferrets, and tigers.

New biochemical studies resulted in the finding that cheetahs in zoos show little genetic variation. This could be one explanation for their poor breeding performance in captivity. NZP has also found that the three forms of lion tamarins, although very different in appearance, are almost indistinguishable biochemically. Additionally, this study showed that the Zoo population of golden lion tamarins is more genetically variable than the wild population. Future studies of the tamarins will focus on the development of more rigorous methods for distinguishing the three types of lion tamarins as well as different lineages within the golden lion tamarin group.

Several new research projects were started on a species completely new to the Zoo's collection. In collaboration with the Duke University Primate Center, the Zoo successfully reproduced, for the first time, western tarsiers acquired from Malaysia. Tarsiers have been seldom maintained or exhibited in zoos due to their delicate and nocturnal nature. The Zoo is currently cooperating with several other zoos and governmental agencies to breed the Guam rail and Micronesian kingfisher. Although both of these species are now extinct in the wild, the animal breeding programs will eventually enable them to be reintroduced into their native habitat on Guam. Similarly, the Zoo is now cooperating with other zoos and wildlife agencies to develop propagation techniques for Hawaii's endangered forest birds by using several native, non-endangered species as research surrogates.

Studies of marine mammals by Zoo staff have resulted in several new advances. The Zoo has now accumulated a unique data set on the milk composition and the concurrent growth and development of several species of seals and sea lions, such that we can correlate these patterns with ecological and evolutionary factors. A new study of the endangered monk seal of Hawaii has found that females nurse pups in addition to their own, a behavior that may derive from ecological conditions and may be influencing the decline in numbers of this endangered mammal. Future studies will assess whether the degree of fostering varies in different habitats.

Zoo staff continue to make major advances in the study of animal communication. The development of a new heart rate monitoring technique in birds now allows the NZP to evaluate the physiological responses of birds to potentially stressful situations, including social interactions. Initial studies have shown that the heart rate of sparrows nearly doubles to 1,000 beats per minute when the bird is stressed. Scientists will now be able to determine whether the singing of other birds or the interaction with other birds during territorial encounters results in a comparable stress level. Additional studies will focus on whether the function of singing by

birds fundamentally differs in tropical vs. temperate songbirds, with the former using song to determine where conspecifics are and the latter using song to disturb listeners as well as to provide distance information.

Zoo staff are conducting important new studies on the relationship between mating systems, reproductive behavior and genetic paternity. Investigations of purple martin behavior suggest that the male of a pair in this colonial breeding species is not always the father of the young that he cares for. Similar results are being found for other species of birds and mammals, suggesting that sociobiological theory concerning the evolution of social behavior may have to be reevaluated.

Public Education and Information - The Zoo seeks to inform and educate the large and diverse audience it serves through a wide range of creative programs and materials. The National Zoo News, a newspaper for area teachers, keeps them informed about the Zoo and its educational programs, ranging from multi-visit activity based programs to single visit tours. "A Closer Look," a special Zoo program for city elementary teachers and their students marked its tenth year in 1987. The program begins with a summer workshop for teachers and is followed by a six week course of study for them and their students during the school year at the Zoo. Over 3,600 children have now graduated from the program. In May 1987 teachers from the past ten years met at the Zoo to celebrate and share their experiences in the program.

In conjunction with its support society--the Friends of the National Zoo--the Zoo offers classes to adults in conservation, animal behavior and exotic animal medicine. Participants completing six courses are awarded a certificate in wildlife studies. To date, several hundred people have received certificates and many more have enrolled in the classes.

In all its programs, the Zoo is placing more emphasis on conservation education. ZooArk, a temporary exhibit on zoos and world-wide conservation programs, was developed and installed in six Zoo buildings. The exhibit, aimed at family audiences, includes interactive elements such as computer games and rotating panels. The Smithsonian Institution Traveling Exhibition Service is planning to circulate the exhibit to other zoos and museums. In addition, new conservation programs are being planned for elementary and junior high school students, and conservation themes are being included in interpretive materials for all new animal exhibits.

People across the United States are able to share in the benefits provided by the Zoo through print, television, symposia and film stories. Nationally televised programs, such as the August 1987 Audubon Society special "On the Edge of Extinction," have underscored the National Zoo's role in preserving endangered species. Other events, like the Sunset Serenades series, featuring folk, jazz and blues concerts, reach out to new audiences to bring them to the Park in the under-utilized early evening hours during the summer months. The "Symposia for the Public" series introduces serious biological topics to the public through illustrated lectures and discussions. The sixth symposium, held in October 1986, provided a behind-the-scenes look at scientific studies conducted at the Zoo. Proceedings of several symposia have now been published and have been received well by the public.

Additional public lectures held throughout the year focus on a variety of wildlife and environmental topics. The most recent lecture emphasized the critical role of invertebrate animals in maintaining the global habitat.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 10 workyears and \$521,000 is requested to support existing facilities at the Zoo (8 workyears and \$327,000), and to support the molecular systematics and evolution program at the National Zoological Park (2 workyears and \$194,000).

Support of Existing Facilities (8 workyears and \$327,000) - The Zoo continues to have a need for additional staff positions in order to support ongoing programs; provide keeper and support staff for newly constructed facilities; and provide for the safety and security of the visitors, staff and living collections. For FY 1989, the Zoo is requesting 8 additional workyears and \$327,000 for one curatorial position, three animal keepers, one medical technician, one trades and craft position, one police officer, and one general maintenance worker as well as support funds to purchase supplies for the newly constructed facilities and exhibits.

One curatorial position (\$42,000) and two animal keeper positions (\$54,000) are needed to support the expanding animal collection as a result of the new aquatic exhibits. In May 1987, the Zoo opened its totally new Invertebrate Exhibit in the basement of the Reptile House. In FY 1989 the Zoo will begin construction on the first phase of the Amazonia Exhibit, with exhibit space scheduled for construction the following year. The three new positions will supplement current animal care staff and provide for a core of keepers and curatorial effort. They will assist in developing animal husbandry techniques for a range of new animals at NZP, including the new Invertebrate Exhibit and Beaver Valley area water exhibits, and provide for operational planning of the actual Aquatic Amazonia Exhibit. The Zoo will begin to acquire the animals for this exhibit as early as next fall. They will include small cats such as margay and jaguarundis and giant otters that will be exhibited for the first time in North America.

A third animal keeper position (\$27,000) will provide the additional care necessitated by the new and updated exhibitry in the Department of Mammalogy. The Zoo currently provides for visitors demonstrations in animal management techniques using elephants, seals, and sea lions. The new keeper position will allow the Zoo to increase the frequency of the programs and provide additional demonstrations with other animals from the collection.

The medical technician (\$29,000) will be assigned to the new Rock Creek veterinary hospital which is scheduled to be fully operational in April 1988. The technician position is needed to support expanded programs in preventive medicine, medical therapy, and surgical techniques in the new state-of-the-art facility at Rock Creek. The addition of this new position will ensure that the advances made in human medicine and life sciences can be applied to the animal collections at the Zoo.

The trades and craft position (\$32,000) and the general maintenance position (\$19,000) are needed to support the maintenance department at the Zoo. With the addition of new facilities and scheduled construction of three major projects at Rock Creek over the next five years, the Zoo will have just under \$100 million invested in new and improved facilities as a result of the Master Plan. To provide for the general upkeep of the facilities and grounds, the Zoo will require additional maintenance support staff. The addition of new facilities and scheduled construction at Rock Creek over the next 5-year planning period require additional maintenance support staff to provide for the general upkeep of the facilities and grounds. The additional police officer (\$24,000) will be used to provide security for the newly constructed facilities at the Zoo to protect against theft, vandalism, injury to the live collection, and provide for the safety of visitors. An additional \$100,000 will

be used by the animal departments to purchase new and replacement equipment and to purchase supplies for newly constructed facilities and exhibits.

Molecular Systematics and Evolution Program (2 workyears and \$194,000) - In FY 1988, with funds of \$176,000 made available as a result of the closure of Smithsonian Environmental Research Center, the Zoo established the framework for programs in molecular genetics and the genetic management of rare and endangered species. The Zoo concentrated on the identification of genetic markers in hoofed stock species known to suffer from the negative effects of inbreeding, through high juvenile mortality and reduced fertility. In FY 1989, the genetic markers will be used to evaluate the genetic "health" of selected species at the Zoo. The Zoo also initiated theoretical studies that will enable it to determine whether relatives behave differently to each other, compared with non-relatives, one of the basic questions in sociobiology. At the same time, the Zoo is expanding the studies of basic and applied problems in conservation biology, and developing models for the long-term management plan for endangered species in captivity. The funding request for FY 1989 will make the programs and laboratory operational and permit the Zoo to apply the techniques of Molecular Genetics to a range of disciplines and theoretical questions from systematics, evolution, sociobiology, population biology, and behavioral ecology to the more applied areas of conservation. Specifically, NZP will be expanding the use of state-of-the-art molecular techniques through the application of molecular probes that permit DNA "fingerprinting."

With this request of \$194,000, the Zoo will hire a laboratory supervisor (\$59,000) and a second laboratory technician (\$29,000). The remaining \$106,000 will be used to purchase lab supplies and equipment to complete the necessary furnishings of the Genetic Lab.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are derived from a variety of sources including fees for providing services and general use of the facilities by Trust fund units or outside organizations. Expenditures are made for the support and maintenance of these facilities, for the purchase of animals for the collection, and for salary and support costs for the director.

Restricted Funds - These are provided through gifts and foundation grants and are used to support specific research projects and education programs. For example, funds provided by a grant from the Packard Foundation are being used to train foreign nationals from developing nations in animal management techniques.

The New Opportunities in Animal Health Sciences (NOAHS) Center was established to build upon the present nascent effort at the Zoo to undertake fundamental investigations in biology and medicine in relationship to exotic animals. Tremendous advances have been made over the last two decades in veterinary medicine, reproductive physiology and biotechnology which are now only being applied to animals in a zoo setting. These monies will be utilized to capitalize and expand on these opportunities by hiring new staff, and purchasing necessary equipment and supplies. New research programs hold hope for improving the quality of care of exotic animals both in zoos and in the wild, and also for increasing species survival through new reproductive techniques.

SMITHSONIAN INSTITUTION ARCHIVES

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	14	591	6	171	-	1	-	-	-	-
FY 1988 -Estimate	15	577	6	255	-	-	-	-	-	-
-Base	15	585								
FY 1989 Estimate	15	644	6	215	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	Base <u>FY 1988</u>	Proposed <u>Adjustments</u>	Est. <u>FY 1989</u>
FTE Allocation.....	15	-	15
11 Personnel Compensation.....	446	6	452
12 Personnel Benefits.....	56	2	58
21 Travel.....	4	-	4
23 Rent, Communications & Utilities.....	4	51	55
24 Printing & Reproduction.....	1	-	1
25 Other Services.....	50	-	50
26 Supplies & Materials.....	20	-	20
31 Equipment.....	4	-	4
Total	<u>585</u>	<u>59</u>	<u>644</u>

Analysis of Increase

Necessary Pay.....	8
Program Funds.....	51

ABSTRACT - The Smithsonian Institution Archives (SIA) is responsible for preserving the Institution's records and for documenting its history. In carrying out this responsibility, the Archives staff surveys records files and determines which should be saved or discarded; accessions useful reference files into the central repository; preserves and administers documents; and performs research for the benefit of Smithsonian staff, outside scholars, and the public.

A program increase of \$51,000 is requested in FY 1989 to fund the cost of providing approximately 4,000 square feet of commercial space for archives storage within the Washington metropolitan area, to accommodate about 12,000 cubic feet of records, and thus satisfy storage needs for present overflow and projected accessions for the next several years. Necessary pay of \$8,000 is required for existing staff.

PROGRAM - The Smithsonian Institution Archives consists of five program areas: records management, acquisition of documents, research, archives management, and outreach.

Records Management - The Archives staff surveys records files in all bureaus and offices of the Institution, appraises their future reference value, and schedules documents for disposal or for transfer and accession into the Archives.

Acquisition of Documentation - Professional papers of Smithsonian research staff and oral history interviews are accessioned into the Archives to complement official records in documenting the history of the Institution. The records and papers are arranged, described, and preserved for indefinite continuing use into the future, and their availability is made known through catalogues and other finding aids.

Research - The Archives staff provides research and reference services on historical topics related to Smithsonian events and development for other Smithsonian staff, outside scholars, and the public.

Archives Management - Archives management involves arrangement, preservation, and description of material accessioned into the Archives; documentation of its provenance, legal and access status, processing and reference use; and sharing of knowledge and experience of archives management with others in and outside of the Institution.

Outreach - The outreach program includes publication and dissemination of information about holdings to the Institution, the worldwide scholarly community, and the general public; provides advice and assistance to other museums and organizations about effective archives and records management practices; and implements new procedures and developments discovered from discussion in professional meetings and articles in professional journals.

Staff and Facilities - The Archives program is staffed by historians, archivists, technicians and clerical personnel. The Archives occupies space in the Arts and Industries Building where the permanent collections are kept and administered for the convenience of staff, scholars, and the public. The Archives also manages a modest records center at 1111 North Capitol Street.

Program Accomplishments - SIA conducted surveys of records in the Freer Gallery of Art and the recently closed Rockville facility of the Smithsonian Environmental Research Center. Accessions in FY 1986 totaled 646 cubic feet, and 1,095 cubic feet were added in FY 1987, bringing the total holdings to 13,441 cubic feet. There were 1,520 reference inquiries in FY 1986, and 1,538 in FY 1987. Items provided for examination by researchers totaled nearly 5,500 in FY 1986 and 5,552 in FY 1987. FY 1986 copying for researchers came to 25,000 pages, and in FY 1987 the total was more than 27,600 pages.

EXPLANATION OF PROGRAM INCREASE:

Rental Space for Archives (\$51,000) - The Smithsonian Archives is requesting an amount of \$51,000 in FY 1989 to rent approximately 4,000 square feet of commercial space for archives storage within the Washington metropolitan area to accommodate about 12,000 cubic feet of records and thus accommodate the present overflow and projected accessions for the next several years.

The Archives is composed mostly of paper documents; however, new accessions include photographic, magnetic tape, and other modern media materials. The growth and diversity of the archives result, by definition, from the records produced yearly from Institutional activities. Annual growth and diversification of the Archives must mirror that of the Institution if effective archival services are to be maintained.

Archives on hand presently exceed shelf capacity by approximately 2,000 cubic feet. Records exceeding the capacity of the stack shelving area are temporarily stored under very inadequate conditions on aisle floors and around the balcony of the Arts and Industries Building (A&I). Annual growth is projected at a rate of about 1,000 cubic feet; therefore, an estimated 8,000 to 12,000 additional cubic feet of space will be required during the coming decade--more if records activity of the Institution increases during that period.

Without additional funds for commercial storage space, archival material will continue to be placed in temporary storage on the A&I balcony. This condition is unsuitable for archives preservation, inefficient for processing and reference, and hazardous to staff in emergencies. This condition will be exacerbated as archives grow. The lack of additional space will require storage of permanently useful records to be dispersed, with access and management difficult. Beyond these immediate effects, failure to come to terms with the inevitable yet purposeful growth of Institutional records jeopardizes the entire archival function. The Institution's ability to provide access to its own records through a central archives is severely reduced, thereby jeopardizing not only Institution-wide accountability but also future research in its records by historians.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are provided by annual allotment and are used to cover the salaries and benefits of an archivist, an archives technician, an archives specialist, three program assistants, and various associated support costs.

SMITHSONIAN INSTITUTION LIBRARIES

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	104	5,115	10	390	-	38	-	41	-	-
FY 1988 -Estimate	97	5,070	10	388	-	58	-	-	-	-
-Base	97	5,119								
FY 1989 Estimate	99	5,079	10	390	-	3	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	97	2	99
11 Personnel Compensation.....	2,770	57	2,827
12 Personnel Benefits.....	352	17	369
21 Travel.....	24	-	24
22 Transportation of Things.....	9	-	9
23 Rent, Communications & Utilities.....	53	-	53
24 Printing & Reproduction.....	130	-	130
25 Other Services.....	761	-5	756
26 Supplies & Materials.....	462	55	517
31 Equipment.....	558	-164	394
Total	<u>5,119</u>	<u>-40</u>	<u>5,079</u>

Analysis of Increase

Necessary Pay.....	55
Program Funds.....	-95

ABSTRACT - The Smithsonian Institution Libraries (SIL) serves the Institution and the public by providing information services to support Smithsonian research, curatorial, publication, and administrative activities; through direct participation in the creation of a national bibliographic data base; and through programs for publications, exhibitions, loan and information services. Its collections, totaling over one million volumes, including over 20,000 serial subscriptions, are available to Smithsonian and outside scholars through a system of 14 branch libraries in 36

locations in the Washington, D.C. area; at the Smithsonian Astrophysical Observatory (Massachusetts and Arizona); the Cooper-Hewitt Museum (New York City); and the Smithsonian Tropical Research Institute (Panama). SIL is also responsible for purchasing all books for all Smithsonian organizations and coordinating all requests for automated information sources; these services help to avoid duplicate library-related procedures and expense within the Institution. For FY 1989, an increase of 1 workyear and \$124,000 is requested to expand its capability to locate and borrow research material from other libraries in a timely manner to support Smithsonian research needs (1 workyear and \$69,000); and to maintain adequate funding for the rapidly increasing costs of serial subscriptions (\$55,000). The FY 1989 estimate reflects a decrease of \$219,000 associated with the multi-year program to develop the collections of the National Museum of African Art branch library, completed in FY 1988. Necessary pay of \$47,000 is required for existing staff, along with 0.5 workyears and \$8,000 required to annualize the partial-year funding of 2 new positions approved in the FY 1988 budget.

PROGRAM - The Smithsonian Institution Libraries (SIL) provides both centralized Institution-wide support and branch libraries with specialized subject research collections to serve the research, curatorial, and other Smithsonian programs requiring bibliographic assistance. The central collections support multidisciplinary research, and emphasize interdisciplinary topics such as management fundraising, conservation, and museology. The specialized collections in the branch libraries are outstanding in natural history, American ethnology and culture, tropical biology, African art, decorative arts and design, astrophysics and the history of science and technology. Rapidly developing collections include aeronautics and astronautics, conservation research, and horticulture. SIL's collections include approximately 35,000 rare books, primarily in science, technology, applied art, aerospace, and natural history. The largest of these rare book collections is the Dibner Collection in history of science and technology, consisting of 19,000 volumes and manuscripts.

The SIL is composed of three operational divisions: Research Services, charged with direct, individual reference assistance and literature search and interpretation for the scholarly users of materials and services in the central and branch libraries; Collections Management, responsible for the selection, acquisition, and preservation of library collections; and Automated Systems, responsible for managing the SIL bibliographic data bases, cataloguing and other automated inventory control of SIL collections, and the application of automation to other aspects of the Libraries' operations. Through centralization of certain operations, including acquisitions and cataloguing, an interdisciplinary reference/information center, a consolidated administrative staff, and a conservation laboratory, SIL has achieved system and cost efficiencies.

Research Services - The primary function of the Research Services Division of the Smithsonian Institution Libraries is to provide reference support for the research and other activities carried on in the museums, bureaus, and offices of the Institution. To this end, SIL is organized into 14 branch libraries which occupy space in 36 separate locations in order to bring both the collections and professional library services as close to the users as possible. The branch staffs range in size from one to a dozen members, depending on the size of the book collections to be serviced and of the user population. All, however, even the smallest, offer sophisticated subject and professional expertise to ensure that users can find the sources they need efficiently and expeditiously. In FY 1987, Smithsonian staff borrowed more than 30,300 items from the SIL collections. In addition, over 14,200 items were

photocopied from materials which do not circulate such as journals or for which the user wanted his own copy. The SIL also loaned almost 7,500 titles to other libraries.

The library staff draws not only on its collections, but also upon the resources of other libraries throughout the United States. When a particular article or monograph is not found in the SIL, the library staff searches published catalogues, printed indexes and one or more of the national on-line bibliographic data bases to identify a library holding that item. A loan request is then placed through an electronic telecommunications network or by mail. During FY 1987, the Libraries borrowed almost 16,000 items from other libraries through these interlibrary loan services.

In addition to locating and making available sources of information for users, the Research Services staff in many instances provides the needed information directly. In FY 1987, they responded to more than 114,300 reference questions. These ranged from simple requests for names, dates and places to complex questions requiring several hours, if not days, of investigation to answer, using both standard reference tools and electronic data bases. Since some patterns soon become apparent in the kinds of reference questions being received in a given subject area, many branches anticipate such requests by producing form letters or compiling bibliographies on specific topics. Thousands of these are distributed annually in response to inquiries, especially by the branches in the Museum of African Art, the National Zoo, the Museum Reference Center, and the Anthropology Library in the Natural History Branch. Some have become so much in demand that they are sent on a regular basis to other libraries, both in this country and around the world, to help librarians and researchers elsewhere with the same questions.

The Research Services Division is also responsible for the housing and maintenance of the collections. In FY 1987, several branches underwent moves to provide them with better arranged and higher quality space. The Office of Horticulture Library and the Museum Reference Center, both in the Arts and Industries Building, were remodeled, reconfigured and reequipped. The Museum of African Art Library was moved from its original Capitol Hill location to the Museum's new facilities in the Quadrangle complex on the Mall. The Museum of American History Library began planning the move of the collections stored in the basement of that building to the SIL facility at 1111 North Capitol Street. The Museum of Natural History Branch undertook the mammoth task of integrating 160,000 volumes from three locations into its newly renovated and expanded library.

Collections Management - The responsibilities of the division include selection, acquisition, preservation and deaccessioning of collections for SIL. Materials selectors in each SIL branch recommend books and journals for acquisition and form a committee to advise management on collection policies. During FY 1987, SIL completed a major revision of its collection management policies, including individual statements for each branch. This revision was forwarded to the Smithsonian's Office of the Registrar to begin the institutional review process.

In 1987, SIL launched an effort to review and reorganize the library and gift collections stored at the Smithsonian Institution Service Center at 1111 North Capitol Street. All gift collections awaiting selection were reviewed; unwanted materials were discarded; and stockpiles of Smithsonian publications and translations were reduced. A contractor sorted and organized a 45,000-piece collection of trade catalogues into an alphabetical arrangement by company name. This work was in preparation for construction to improve the environmental conditions of the Libraries'

facilities there, prior to establishing it as a combined service facility, designated as the Smithsonian Institution Libraries Remote Annex (SILRA). SILRA will house less heavily used library collections under central SIL management, serve as a processing/staging area for large collections, and include a preservation facility.

The Libraries continued to address the recommendations contained in the internally generated document entitled, Final Report of the Preservation Program (May 1986). The proposed plan of action pointed to the need for SIL to increase the resources devoted to preservation of its general collections (items not housed in rare book facilities). In particular, the plan highlighted the fact that nearly one-third of the SIL collections, including over 90 percent of the volumes published between 1870 and 1930, are too brittle to withstand further use. Recruitment began in the mid-summer of 1987 to hire a preservation specialist to initiate, establish, and administer the policies and procedures needed to tackle this problem. Since brittle paper cannot be restored, a variety of actions will be needed, which may include both replacement of materials and conversion to more stable formats, such as microform.

Automated Systems - Since FY 1974, SIL has participated in a national bibliographic data base, the On-line Computer Library Center, Inc. (OCLC), with 6,000 member libraries, which is used as a source for its bibliographic records and for interlibrary loans. In 1984, the Smithsonian implemented its on-line automated bibliographic system, the Smithsonian Institution Bibliographic Information System (SIBIS). SIBIS allows the Libraries to create an integrated on-line system with a central data base of bibliographic information, thus eliminating the need for multiple keyboarding and manual processes. SIL is gradually replacing all card catalogues, microfiche catalogues, circulation files, and other paper files, with a single source of bibliographic information that can be updated continuously and accessed from locations anywhere in the Institution. The SIBIS acquisitions module permits on-line book and journal ordering, processing of orders, account maintenance, interface with accounting, and ready on-line access to order information. Smithsonian researchers, including those in the field, are now able to dial into the SIL catalogue for information and will eventually relay requests from wherever there is a computer/telecommunication link. The on-line catalogue provides more and better access to the collections employing sophisticated search keys, such as key word and Boolean logic.

Automation of SIL functions continues to extend beyond SIBIS. At the close of FY 1986, SIL implemented an Electronic Mail System linking all of its staff. Early in FY 1987, a tape of all SIL holdings was sent to a major library support company for matching with Library of Congress authorized names and subjects. This will enhance access to the collection allowing name, subject and other cross-references in the on-line catalogue. A tape of SIL museology holdings was produced for loading on the International Council of Museums (ICOM) computer in Paris. Management, processing, and user-requested reports are available from the automated library system. An Office Automation System for the central SIL administration was implemented in 1987.

By the end of FY 1987, the contract portion of retrospective conversion of manual bibliographic records to machine-readable form was substantially completed. Barcodes were automatically assigned to all of the machine-readable records of the SIL and barcode labels were produced. These are now being applied to over 450,000 volumes.

During FY 1987, the Libraries also continued to make measured progress in the cataloguing of previously uncatalogued backlogs, including rare books, gift and trade literature collections. Although contracts for retrospective conversion and catalogu-

ing, and rare book cataloguing, plus increased use of volunteers and new technologies afforded by the automated system have reduced the number of items left uninventoried, the Libraries are particularly eager to eliminate the uncatalogued backlog of rare books, which had been the subject of the findings of several audit reports on the Libraries' collections. During FY 1987, the first in a series of contracts was awarded for the cataloguing of rare materials. With funding provided in FY 1988, the Libraries will be able to accelerate the cataloguing of these uncatalogued materials. With the expanded base funding of \$345,000, the Libraries projects that at current prices it will take at least six years to catalogue all previously uncatalogued material in its collections.

Outreach - The Libraries continues its national and international responsibilities in the areas of exhibitions, seminars, lectures, publications, translations, and participation in national and international forums.

In FY 1987, the SIL Lectures and Seminar Series included "The 'Wheel of Aristotle' in Guevara and Galileo," presented in honor of Silvio A. Bedini who retired after 26 years at the Smithsonian. The lecture was given in conjunction with an SIL exhibition on "Aristotelian Science in the Dibner Library." SIL also presented a panel discussion open to the public entitled "Books in the Attic: What Are They Worth?"

The tenth anniversary of the opening of the Dibner Library of the History of Science and Technology was celebrated in October 1986 with the opening of "Nota Bene," an exhibition featuring 29 annotated rare books dating from 1469 to 1921. The second exhibition honoring the Dibner Library's tenth anniversary year, "Aristotelian Science in the Dibner Library," opened in January 1987 and featured 19 manuscripts and early printed books also collected by Dr. Dibner. Both exhibitions were described in handsomely printed checklists. In March, the Dibner Library mounted an exhibition of rare books, "Classics of Physiology," commemorating the founding of the American Physiological Society in 1887.

From July 1987 through January 1988, SIL celebrated the tenth anniversary of its Book Conservation Laboratory by an exhibition and a catalogue describing conservation materials and techniques, bindings, treatments, and methods of paper restoration.

With funding provided through the Institution's Special Foreign Currency Program, the Libraries administers the Science Information Program for Translations. Continuing funding for this program will be sought from the U.S.-India Fund for Educational, Cultural, and Scientific Cooperation. Through this program, scholarly articles and monographs on the natural sciences and cultural history originally published in foreign languages have been published and made available to American scholars in English translations. The published translations are registered with the National Technical Information Service (NTIS) and the National Translations Center to ensure their wide-spread availability to scholars. Currently SIL is administering the editing by scholars of 16 translated manuscripts, and nine other works are in production in India.

In July 1987, the SIL Publications Program co-published with the American Cut Glass Association L. Straus & Sons Richest Cut Glassware, a facsimile of a 19th-century trade catalogue with an introduction and index added. Research continued on two more books in the SIL Research Guide Series. Libraries and individuals around the country continued to request copies of the popular Book Collecting and the Care of Books. A total of 1,075 have been distributed since the pamphlet was first issued in

1985, and a new edition was prepared for distribution in September 1987. Branch library guides were printed for the new Museum of African Art Branch which opened in September 1987 and for the National Museum of Natural History Branch which was renovated in the same year. A brochure on "Gift Information for Donors" was printed and several information sheets for users and visitors were made available in the 14 branch libraries.

SIL staff participated in a number of professional meetings and published collectively five books, 24 articles, two reports, and many book reviews since FY 1986. SIL welcomed visitors from the United States library community as well as librarians from the People's Republic of China, Japan, and Indonesia.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 1 workyear and \$124,000 is requested to expand the Libraries' capability to locate and borrow research material from other libraries in a timely manner to support Smithsonian research needs (1 workyear and \$69,000); and to maintain adequate funding for the rapidly increasing costs of serial subscriptions (\$55,000). The FY 1989 estimate reflects a decrease of \$219,000 associated with the multi-year program to develop the collections of the National Museum of African Art branch library, which was completed to FY 1988.

Expanded Support for Interlibrary Loan Services (1 workyear and \$69,000) - The national system of interlibrary loans, developed by the American Library Association (ALA), allows libraries to supplement their own collections by requesting the loan of material from other libraries instead of having to purchase it. Traditionally, the requesting library must search through union catalogues and other master listings of libraries to locate one that has the material needed, send out a request form to borrow, and wait for the receipt of the material. If the material is not available for interlibrary loan from the library asked or is in circulation, the borrowing library must search for another library that possesses the material and the requesting process must be repeated. With the development of national bibliographic data bases, such as OCLC, processing of interlibrary loan requests has become much more efficient, because requesting libraries can locate all the libraries possessing the needed material at one time through a computer search of the data base and can request the loan of the material by computer as well. Furthermore, commercial, computer-based document delivery services have proved even more effective.

For FY 1989, an increase of 1 workyear and \$69,000 is requested to expand the Libraries' capability to locate and borrow research material from other libraries in a timely manner. Smithsonian researchers are often impeded in their work because the collections of the SIL do not contain the source materials required or because the materials cannot be readily identified, located and delivered from outside. Obtaining the necessary research materials by means of traditional ILL services, either from other national libraries such as the Library of Congress or the National Agricultural Library, or from libraries elsewhere in the country, is a cumbersome and time-consuming process with an average response time of one month from request to receipt of material. The SIL wants to remedy this situation so that a researcher can reasonably expect to find needed information he needs within the collection or have it procured for him within two weeks. This need has become even more critical due to extraordinary increases in journal subscription rates, which are forcing SIL to cancel many subscriptions and ban the purchase of new ones.

During FY 1985, SIL conducted a study to analyze fulfillment rates and turnaround times for ILL requests for journal articles. A substantial portion of requests (39

percent) sent by traditional means -- i.e., mailing out the traditional American Library Association forms -- were not filled within a three-month period.

Response is much better when the On-line Computer Library Center, Inc. (OCLC) is used as the means of transmitting the request. Eighty-five percent of the items are found in the first library queried by the computer and only five percent remain unfilled when they have been searched for in all five libraries to which an OCLC query is automatically transmitted. Another means of filling requests is to use commercial, automated, document-delivery services, which has proved remarkably effective. All rejects from traditional queries have been passed on to such a service and of the several hundred now processed, few, to date, have not been located anywhere.

Turnaround time shows a parallel gradation of effectiveness. Traditional requests take an average of one month for return of the item. This figure includes the national libraries (such as the Library of Congress, the National Agricultural Library and National Library of Medicine). The document delivery services have been responding in under 10.5 days. Since rapid service is a prime consideration in the provision of SIL services, the use of a computer-based, document-delivery service would allow the Libraries to achieve this goal effectively.

In FY 1987, the SIL devoted \$25,000 from its book budget to continuing the use of on-line document delivery services since its importance to research is paramount. The experience gained indicated that this is the most cost effective and the most suitable response to Smithsonian research needs. For FY 1989, the requested increase of \$50,000 would allow the Libraries to establish a stable base of funding to use on-line document delivery for interlibrary loan. This is the single most effective step which may be taken to permit rapid, comprehensive and efficient library support for current research of all kinds at the Smithsonian.

A second important step in improving the delivery of the information needed by Smithsonian users would be to reduce the turnaround time required for filling ILL requests from the Library of Congress, which accounts for one-third of ILL borrowing. Increased borrowing from the Library of Congress by other libraries nationwide and budget and staff cuts at the Library of Congress have created a serious bottleneck in the provision of interlibrary loan services. As a result of a cooperative agreement, the Smithsonian Institution Libraries maintains a "SIL desk" at the Library of Congress to expedite the high volume of ILL processing for material borrowed by Smithsonian staff. For FY 1989, an additional library technician position (1 workyear and \$19,000) is requested by SIL for its ILL unit to assist in locating materials at the Library of Congress, in checking them through the Library of Congress circulation system on a priority basis, and in photocopying those which do not circulate (i.e., all serials).

By providing prompt and accurate delivery of information to researchers, the SIL will help to insure the quality of Smithsonian program products. Moreover, SIL's intention to improve the delivery of source materials to Smithsonian scholars will have direct impact on research at the Smithsonian.

Serial Subscription Costs (\$55,000) - For FY 1989, additional funding of \$55,000 is requested to maintain adequate funding for the rapidly increasing costs of journal subscriptions, particularly those which are published in foreign countries. SIL began to face a serious problem with costs of journal subscriptions in FY 1987. The rapid fall of the dollar against foreign currencies combined with an extraordinary inflationary rise in subscription rates caused an overrun of 16.5 percent against the

FY 1987 Serials Budget. Based on industry projections compiled by the Faxon Publishers' Service Bureau, a further overall increase of at least 15 percent is expected in FY 1988, with foreign journals leaping 25-30 percent. This means that in a two-year period, the cost of maintaining SIL's current subscription list is expected to rise over 30 percent.

These projections are supported by actual cost data for the journal subscriptions that the SI Libraries purchases. The average subscription price for SIL journals has risen from \$107 to \$133 since 1985, an increase of 24 percent. Numerous journals that Smithsonian researchers find indispensable to their research have risen even more dramatically in price from 1986 to 1987, including Abstracts in Anthropology (120 percent); the Journal of Molecular Evolution (117 percent); and Zeitschrift fur Zoologische Systematik und Evolutionsforschung (68 percent).

To cope with this crisis, SIL has embarked on a serious review of serials, involving curators, researchers, and SIL staff, with the target of reducing the list to only essential titles. Nearly \$25,000 of subscriptions for journals were cancelled for FY 1988. Examples of some of the journals cancelled because of their high cost subscriptions include Biochemistry of USSR (\$960); Biological and Agricultural Index (\$923); and Analyst, Analytical Abstracts & Proceedings (\$821). Additional titles, with subscriptions totaling an estimated \$70,000, are being targeted for cancellation in FY 1989 if funds cannot be found to cover their costs. A moratorium has been placed on ordering new subscriptions. This will seriously affect SIL's ability to support the need of Smithsonian researchers for information on current research.

Access to up-to-date literature in journals is an indispensable part of a scholar's life. Such journals are tools to understanding and are as equally important as research equipment. If the SI Libraries cannot maintain the journal subscriptions that are needed by Smithsonian Scholars, then it will be forced to depend more heavily on interlibrary loan and document delivery services to meet the demand of Smithsonian researchers for access to this up-to-date literature. However, since the current fiscal situation has hit all libraries hard, it is likely that these libraries will also respond by cancelling subscriptions, perhaps even for those journals to which Smithsonian researchers must have access. The requested increase will allow Libraries to maintain adequate funding for these rising costs.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - Funds supplied by administrative allotment are used primarily for salaries and related support costs including travel, training, and supplies. A program allotment supports such special events as public lectures and seminars. In addition, a special purpose fund awarded in 1984 has been supporting the dissemination of information by enhancing the collections and services of SIL, and preservation of library materials through binding and other restoration programs. This fund is expected to be depleted in FY 1988.

Restricted Funds - These are provided through gifts and grants from individuals, foundations, endowments, organizations and corporations for specific purposes. These funds will support the preparation costs for a future publication on international exhibitions and provide for the purchase of rare volumes on the history of science.

MAJOR SCIENTIFIC INSTRUMENTATION

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	-	-	-	-	-	-	-	-	-	-
FY 1988 -Estimate	-	525	-	-	-	-	-	-	-	-
-Base	-	525	-	-	-	-	-	-	-	-
FY 1989 Estimate	-	1,206	-	-	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	-	-	-
21 Travel.....	7	32	39
23 Rent, Communications & Utilities.....	-	5	5
24 Printing & Reproduction.....	3	-	3
25 Other Services.....	515	179	694
26 Supplies & Materials.....	-	140	140
31 Equipment.....	-	325	325
Total	<u>525</u>	<u>681</u>	<u>1,206</u>

Analysis of Increase

Program Funds..... 681

ABSTRACT - The development of major scientific instrumentation for Smithsonian research programs is important to enable Smithsonian scientists to remain at the forefront of their fields. Because of the magnitude of the costs involved in the alteration or reconfiguration of existing instrumentation and in the fabrication of new instrumentation, and the unique aspects of the work to be done, funding is requested for projects of this sort under this new line-item, rather than under individual bureau line-items. Since these projects will, of necessity, require long-term development as well as multi-year funding, it is requested that these funds be made available until expended, unlike the remainder of the Salaries and Expenses appropriation which is a one-year appropriation.

For FY 1989, an increase of \$681,000 is requested to initiate the design of a Submillimeter Telescope Array (\$611,000), and to continue the conversion of the Multiple Mirror Telescope (\$70,000). The FY 1988 and FY 1989 estimates in the table above also reflect the requested transfer of the Smithsonian Astrophysical Observatory's (SAO) base funding of \$525,000 associated with the MMT conversion, originally provided for FY 1988 in that bureau's line-item. For FY 1988, this amount is one-year funding. (Funding for the personnel costs associated with the Submillimeter Telescope Array is requested, on the other hand, in the SAO line-item, as discussed in the narrative there.)

PROGRAM - The development of major scientific instrumentation, such as telescopes, requires careful research and development over an extended period of time by concentrated teams of Smithsonian scientists, technicians, and contractors, for such critical sub-elements as optics, detectors, receivers, and structural forms. It has become increasingly difficult to conduct orderly and cost-effective long-term planning for the design and construction of major instrumentation within the restriction of the traditional one-year funding provided by the Salaries and Expenses appropriation.

To accommodate the unique research and development (R&D) requirements for acquisition of major scientific instrumentation, this new line-item has been established. A no-year provision for it will allow the flexibility that is so critical to the development of telescopes and other leading edge scientific tools. The development of such instruments, involves, almost by definition, the unknown, since researchers are pushing back the frontiers of science and technology. As a result, certain elements of a particular instrument may develop at different rates, requiring budgetary flexibility among such elements. In addition, different projects could develop at different rates, for which such flexibility would be at least as helpful.

Beginning in FY 1989, funding is requested under the Major Scientific Instrumentation line-item for two projects for the Smithsonian Astrophysical Observatory: (I) the development of an array of submillimeter telescopes; and (II) the conversion of the Multiple Mirror Telescope. Both of these forefront scientific projects involve the fabrication of major new instrumentation that will take a number of years to design and complete. The development of the submillimeter telescope array is anticipated to continue through the mid-1990s and will require total funding currently estimated at \$30 million (1987), for construction on a continental site, and about 25 percent more for construction on a prime site in Hawaii. The conversion of the Multiple Mirror Telescope, which might be completed as early as 1992, will require an estimated total funding of \$10 million from the Smithsonian.

EXPLANATION OF PROGRAM INCREASE:

Construction of an Array of Submillimeter Wavelength Telescopes (\$611,000) - The last frontier for ground-based astronomy consists of observing the skies with telescopes sensitive to submillimeter waves--light with wavelengths between those of infrared and radio waves. The formation of stars and planetary systems and the puzzling processes taking place in the cores of galaxies and quasars can best be studied at submillimeter wavelengths because the radiation from these objects is usually much more intense at these than at other wavelengths. In the past few years, technology has advanced sufficiently to allow instrumentation to be built with characteristics suitable for use in submillimeter-wavelength astronomy.

The desirability of submillimeter wavelength observations was recognized in the 1982 ten-year plan of the Astronomy Survey Committee of the National Research Council (NRC), and several single-antenna telescopes designed for submillimeter wavelength work are now beginning construction or operation. These telescopes are expected to dramatically advance the field, but none of them will be able to discern details finer than about 10 seconds of arc. Therefore, their resolving power will be nearly a hundredfold inferior to that of the leading astronomical instruments in other wavelength regions, including the Very Large Array (VLA) and the Hubble Space Telescope (HST), and will even be about tenfold inferior to that of ground-based optical telescopes.

The NRC study also recommended development of advanced spatial interferometers at all wavelengths as a means of improving resolving power. SAO's proposed submillimeter wavelength telescope array will be a premier realization of the NRC's recommendation. The idea for this array stems from 1984 when a committee of seven SAO scientists published a study reporting on the scientific need for, and technical feasibility of, such an interferometric array. In particular, the committee recommended an array of six submillimeter wavelength telescopes, having resolving power of better than 1 second of arc--far finer than that of any single-antenna submillimeter wavelength telescope, and comparable to that of the VLA and the HST. This 145-page report was distributed among astronomers worldwide, and detailed solicited reviews were received from 25 astronomers with relevant expertise (about a dozen other signed reviews were also received). The consensus conclusion of the report and of the reviews is that a submillimeter wavelength array has very high scientific potential, is technically feasible, and is of appropriate scale for undertaking by SAO.

The main recommendation of the report, and of many of the reviews, was that SAO first develop expertise in submillimeter receiver techniques, a new and growing field of critical importance for the array. With funding of \$150,000 provided in FY 1987, SAO has begun development of submillimeter wavelength receiver instrumentation, including hiring a receiver scientist, and establishing and equipping a research laboratory. With the increase of \$252,000 provided in FY 1988, SAO will continue to develop the technology for submillimeter receivers and, in particular, to build receivers for use on existing telescopes.

With the SAO receiver effort underway, it is appropriate to develop a detailed design for the array. For FY 1989, funding is requested in the SAO line-item (personnel costs only) and in the Instrumentation line-item to initiate the design study for the submillimeter telescope array.

The requested funding will allow SAO to hire a project scientist, a digital leader, and a software leader to conduct the two-year design study for the submillimeter telescope array. They, with the receiver leader (being hired by SAO in FY 1988) and with essential help from appropriate contractors, as well as in consultation with outside experts, will study possible array sites and telescope layouts; antennas, correlators, computers, and receivers; and the cost-benefit tradeoffs associated with the designs of the individual subsystems and their integration into a functioning array. This team will also study and build subsystem prototypes and conduct computer simulations, as part of this design study. (For certain tasks, use of contractors is more appropriate and cost effective, such as for the analysis and construction of antenna prototypes.)

The main elements of the FY 1989 design study (and their costs) are receiver prototypes (\$90,000); digital correlator prototypes (\$210,000); antenna options

(\$250,000); computer options (\$50,000); site visits and analyses (\$11,000); and the personnel costs of the new staff mentioned above (3 workyears and \$199,000). The receiver costs are primarily for equipment and materials necessitated by this new application to the array. The design study will take two years to complete, and will pave the way for the start of major construction. If construction proceeds at the end of the two years, then over the five-year period, starting with FY 1989, the projected costs are currently estimated at a total of approximately 20 million (1987) dollars. The anticipated total number of new positions required for this project over the next five years is 31, with three positions in FY 1989, six positions to be added in FY 1990, nine in FY 1991, ten in FY 1992, and three in FY 1993. Some of these positions during the construction phase, might be replaced by contractor employees. The following chart shows the total level of funding required for the project from FY 1989 through FY 1993:

PROJECTED FUNDING FOR SUBMILLIMETER TELESCOPE ARRAY
FY 1989 - FY 1993
(FY 1987 Dollars)

	<u>FTE</u>	<u>(\$ millions)</u>	<u>1</u>	<u>2</u>
FY 1989	3	0.8		
FY 1990	9	1.7		
FY 1991	18	5.0		
FY 1992	28	6.5		
FY 1993	<u>31</u>	<u>6.0</u>		
TOTAL ³	<u>89</u> ⁴	<u>20.0</u>		

- ¹ Rounded to the nearest \$100,000
- ² Includes all personnel costs for the project.
- ³ Additional funding for completion of the array will be required in FY 1994 and FY 1995; see text.
- ⁴ Represents the cumulative workyear requirement over the five year period; see text.

Completion of the array is expected to take an additional two years (after FY 1993), to cost an additional \$10 million (over the \$20 million), and to require two additional positions (over the 31 positions). These estimates include 20 percent for contingencies and assume that the array will be located on a continental site. Construction on a prime non-continental site, such as Mauna Kea, Hawaii, would cost about 25 percent more, but would require no additional personnel. Such a location, however, might be preferable because it would provide a significantly larger percentage of time when the array could be used to its fullest capability, thus maximizing the scientific return. Annual operating expenses for the array are estimated to be about 8 percent of construction costs. The majority of these expenses would be for personnel, most of whom would already be supported through the new SAO positions funded in the design and construction phase of the project.

A submillimeter wavelength array as envisioned by SAO will make fundamental contributions to astronomy and astrophysics in at least four areas. (1) For studies of star formation, the array offers the prospect of detecting and studying long-sought evidence of gas falling into very young stars. The array will provide images of high-velocity flows from recently formed stars with unprecedented resolution and sensitivity, thus elucidating the mechanisms that limit the growth of a star, and answering the fundamental question: Why is the sun the size it is? The array will

map the structure and motions of the disks that eventually contract into stars and allow scientists to study their role in forming multiple star systems and planets.

(2) The array will make fundamental contributions to the study of galaxies. Detailed maps of the regions from which emission from carbon monoxide molecules comes will provide for the first time a clear view of the spiral structure of galaxies outlined by giant molecular clouds. At the same time, the array will allow the emission from the dust surrounding young stars to be studied, and so reveal centers of star formation not visible with optical telescopes. These two new views of galactic structure will add greatly to our understanding of the now mysterious ways that spiral patterns in galaxies originate and are maintained.

(3) Because of its high sensitivity, the array will provide accurate measurements of the submillimeter wavelength emission from quasars and active nuclei of galaxies--to clarify the relationship between these enormously energetic objects and to try to learn the source of their energy. These measurements will be crucial to distinguishing between the mechanisms leading to quasars that emit radio waves and those that do not, one of the most important unsolved enigmas in our quest for understanding the source of energy in quasars.

(4) The array will give new information about the surfaces and atmospheres of planets and other objects in the solar system. Maps of Mercury, Mars, Saturn's rings, and some dozen other bodies will reveal the temperature and structure immediately beneath the surface and provide information needed to understand the nature of the subsurface composition. Observations of the emission from molecules in the atmospheres of Venus and Saturn's satellite Titan should also provide insight into planetary weather.

In addition, the array is likely to make unexpected discoveries, since only a few telescopes will be able to work at submillimeter wavelengths, and since the array's ability to discriminate spatially will be at least ten times greater than that of any of these other, single, submillimeter telescopes.

The studies mentioned above involve research programs conducted in all of SAO's divisions, and scientists from each division would participate in the observations and in their analysis and interpretation.

When it becomes operational, the SAO submillimeter wavelength array will be a major scientific instrument of international stature. If begun soon, it will be unique in the world in its combination of wavelength coverage and resolving power, and it is therefore important to the scientific competitiveness of the United States that the array be built--other countries, such as the United Kingdom, are already beginning to plan such instruments. Since astronomical observations from space are suffering severe delays, due to the Challenger tragedy, the construction now of pioneering ground-based instruments such as the SAO array is especially timely for our Nation to retain an eminent place in world science.

Conversion of the Multiple Mirror Telescope (\$70,000) - With funding of \$525,000 provided in FY 1988, SAO will begin the design work to convert the Multiple Mirror Telescope (MMT) by replacing the six mirrors of the MMT with a single, 6.5-meter diameter, mirror, the largest that can fit in the present MMT structure. This improvement is the most cost-effective approach to ensure that Smithsonian astronomers remain in the forefront of optical and infrared astronomy through the remainder of the

20th century. Because this conversion would have the great advantage of being a modification to an existing facility where many of the subsystems--the telescope mount and the rotating building, for example--would remain intact, substantial saving will result in comparison to building a new facility. At the same time, the telescope is expected to be out of use for only six months or less. The MMT conversion might be completed by 1992 with a relatively modest total expenditure by the Smithsonian of approximately \$10 million. This total is composed of amounts allocated in FY 1987 for glass and refractories, mostly from Institutional Trust funds, and of the amounts indicated in the following chart.

PROJECTED FUNDING FOR CONVERSION OF THE MULTIPLE MIRROR TELESCOPE

FY 1988 - FY 1992
(FY 1987 Dollars)

	<u>(\$ millions)</u> ¹
FY 1988	0.5
FY 1989	0.6
FY 1990	3.0
FY 1991	3.0
FY 1992	<u>2.0</u>
TOTAL	9.1

¹ Rounded to the nearest \$100,000

For FY 1989, the requested increase of \$70,000, along with the base funds of \$525,000, will be used to fabricate a support for the mirror to be used during the grinding of its surface to produce the required shape, and to begin the next step in the design of mechanical parts of the new telescopes structure, including the optical support and the mirror cell. (The sum of \$525,000 provided in FY 1988 was part of the one-year appropriation for SAO. For FY 1989, the total amount of \$595,000 is requested as no-year funding.)

The converted MMT will have twice the collecting area of the present instrument and be able to observe nearly one hundred times more of the sky at any one time. This wide field of view of the converted telescope will allow observation of many objects simultaneously and, for certain types of problems, will realize upwards of a hundredfold increase in efficiency of data collection over that now possible with the MMT. This new capability will be especially beneficial for the study of clusters of stars and galaxies. Projects such as studies of the dynamics of clusters of stars, in which SAO scientists have been very active, and which require many nights on the MMT, could be completed in a few hours. The similar study of clusters of galaxies, hitherto prohibitively demanding of telescope time, also becomes feasible. These latter investigations may hold the key to our understanding of how most of the matter in the universe is distributed. This distribution has a fundamental bearing on the evolution of the universe, in particular on how galaxies formed--a basic question that has baffled scientists for decades.

The increased collecting area of the converted telescope will allow data of the same quality as now obtained to be gathered on objects 2.5 times fainter. This improvement will allow the converted telescope to be used in many new areas of research, where the present telescope is limited by the extreme faintness of the objects involved. The added light-gathering power means that more than twice as large

a part of the universe is accessible for study than is now possible. SAO has already established itself as a world leader through the discovery and study of the "bubble" structure of the universe, and expanding such studies beyond the MMT's present horizon will be very important to determine if even larger structures exist; if they do, our understanding of the evolution of the universe might again have to be entirely rethought.

In addition, it will be possible to measure the velocities of gas in very distant galaxies. These velocities, which are often related to the intrinsic brightnesses of the galaxies, can then be compared with the apparent brightnesses of the galaxies to determine their distances. This technique would allow us to determine the rate of expansion of the universe when it was younger, another critical measurement for understanding the evolution and ultimate fate of the universe: will it continue to expand forever, or will it eventually collapse?

The increased collecting area will for the first time, too, allow the study of certain rapidly changing astrophysical phenomena. In such cases, changes occur too rapidly to be studied with any of today's telescopes; for example, some of these rapidly changing processes take place in double stars whose members are so close to each other that their surfaces almost touch, and in systems with one star whose core is so dense that not even light can escape from it--a black hole. Such systems give rise to very unusual conditions, the study of which would allow us to gain insights into new physical processes.

These examples provide just a small sample of the scientific justifications for the conversion of the MMT. A conference held at SAO in April 1986 resulted in a 50-page proceedings which discusses in more detail the various justifications for the conversion.

The timing of the conversion depends on the availability of the large facility at the University of Arizona that will cast and polish the mirror. The mirror for the MMT conversion is now scheduled for the period between the initial operation of the facility and its expansion to produce mirrors eight meters in diameter. If funding limitations make it impossible to take advantage of this opportunity, the MMT conversion would be delayed for many years, in view of the present demand for eight-meter-diameter mirrors. Such a delay would lead to a substantial loss of research opportunities, and SAO's preeminent research position would be seriously eroded. In addition, when coupled with the increased attraction of institutions that will have large telescopes, a delay would make it increasingly difficult to bring the best young optical astronomers to SAO or even to maintain the quality of the present research staff in this field.

OFFICE OF ASSISTANT SECRETARY FOR MUSEUMS

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	23	1,048	1	147	-	72	3	332	-	1
FY 1988 -Estimate	24	1,083	1	190	-	65	-	182	-	-
-Base	24	1,096								
FY 1989 Estimate	24	1,111	1	193	-	56	1	81	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	24	-	24
11 Personnel Compensation.....	707	10	717
12 Personnel Benefits.....	101	5	106
21 Travel.....	22	-	22
22 Transportation of Things.....	3	-	3
23 Rent, Communications & Utilities.....	13	-	13
24 Printing & Reproduction.....	12	-	12
25 Other Services.....	87	-	87
26 Supplies & Materials.....	43	-	43
31 Equipment.....	108	-	108
Total	<u>1,096</u>	<u>15</u>	<u>1,111</u>

Analysis of Increase

Necessary Pay..... 15

ABSTRACT - The Office of the Assistant Secretary for Museums coordinates and provides direction to the Institution's museum-related activities, including collections management, exhibitions, education, interpretation, and public orientation; maintains a liaison with national and international museum organizations and undertakes special studies for museum operations and methodologies. The Office of

Museum Programs and the Office of the Registrar are contained in this line-item. No program increase is requested for FY 1989. Necessary pay of \$15,000 is required for existing staff.

PROGRAM - I. The Office of the Assistant Secretary for Museums - With base resources of 9 workyears and \$556,000, the Office oversees the museum-related functions of the Smithsonian museums and bureaus. The Office also administers projects, programs, exhibitions, and publications commemorating significant individuals and events; the Collections Acquisition Program, which was established to facilitate the purchase of major acquisitions by the Smithsonian museums; the Special Exhibition Fund, which provides partial funding for important and/or innovative exhibitions; and the planning for the renovation of the General Post Office Building. It also coordinates the activities of American Indian programs throughout the Institution.

In addition, the Office works closely with national and international museum organizations and professionals to enhance the scholarly, exhibition, educational, and collections management functions of museums; to encourage the development and application of new techniques in museum administration and practices; and to establish and improve museum training programs.

II. Office of Museum Programs - With base resources of 12 workyears and \$406,000, the Office of Museum Programs (OMP) conducts specialized services and training programs for museum personnel from American and foreign museums. These programs include approximately 50 museum practices workshops annually both at the Smithsonian and in other locations; activities designed particularly for the American Indian community; internships in museum practices; visits to the Smithsonian for museum professionals; and an annual minority awards program. The Office offers special conferences and consultations. Museum consultations and career counseling were provided for over 200 national and international students and museum personnel in FY 1987. The Office also produces and distributes informational and audio-visual presentations on conservation and museum practices for loan and sale to museums and educational organizations. The Office currently is involved in a 6-year project to investigate how museums can increase their educational contributions to the community. In addition, the Office provides program supervision for the Museum Reference Center, which is the major library source of museum-related information in the United States.

The Native American Museums Program of the Office of Museum Programs coordinates Native American training, services and specially designed educational opportunities for those who are involved in the study and preservation of Indian, Inuit, and Aleut collections. In FY 1986, the program sponsored an Exhibition and Design Workshop and practicum that included onsite technical assistance; produced the slide-tape program, "Tribal Archives: Getting Started"; published the proceedings of the 1983 National Workshop; updated the Resource Guide; compiled for publication "A Brief Reference Guide for Material Collections Concerning Native American Culture and History," and "Native American Collections held in European Museums and Archives"; and produced information packets, audio-visual productions and a newsletter. In FY 1987, the Native American Program focused on individually-designed training opportunities for mid-career employees. Five American Indian participants attended a week-long OMP workshop and investigated selected topics for two weeks to three months. The publication activities for a mailing list in excess of 5,000 names and consultation services for approximately 200 written and walk-in requests continued. Planning was initiated for 1989 internships and for a future seminar on cultural differences which is anticipated to include a film on ecomuseums.

III. Office of the Registrar - With base resources of 3 workyears and \$134,000, the Office of the Registrars is responsible for the development, oversight, and coordination of the Smithsonian's collections management policies. In FY 1986, the Office of the Registrar established a steering committee to plan and promote the concept of an Institution-wide Collections Information System (CIS). The Office of the Registrar reviews collections accountability procedures, including the inventory-related activities of the Institution. The Office acts as an advocate for continued support and as a catalyst for new initiatives to insure physical care of the National Collections. The Office serves as a central outreach unit, bringing Smithsonian collections management programs to the attention of Smithsonian management and to the wider museum community.

The Office coordinates the Smithsonian Registrars Council which conducts cooperative, inter-bureau efforts and which acts as an information exchange opportunity to the membership. In 1988, the Office of the Registrar expanded the Registrars Council by featuring meetings of interest to the Washington area collections management community.

In conjunction with the Office of Museum Programs, the Office facilitates regular seminars and workshops on aspects of collections management. These seminars and workshops are extended nationwide and encompass a variety of significant registrarial topics such as: acquisition and deaccession practices, the role of the registrar, storage and handling, collection security, legal issues and more.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided by annual allotments and small fees for services. The allotments support the costs associated with the Office of the Assistant Secretary and provide for memberships for the Institution in the American Council of Learned Societies and the American Crafts Council. The Office of Museum Programs has two revolving Trust funds for training and for the audio-visual loan program to accommodate small fees for services.

Restricted Funds - The Office of Museum Programs continues to receive support from the Kellogg Foundation to "expand the educational influence of museums." The grant enables the Smithsonian to assume a leadership role in the establishment of a museum network in the United States examining issues and ideas that will increase the museums' educational impact in their communities. All aspects of museum operations are being explored with representatives from museums and education fields.

NATIONAL MUSEUM OF NATURAL HISTORY/MUSEUM OF MAN

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	496	22,673	2	280	1	1,381	6	1,781	23	803
FY 1988 -Estimate	550	23,762	2	266	4	532	11	3,717	30	853
-Base	550	24,053								
FY 1989 Estimate	577	26,209	2	203	4	482	10	2,951	27	682

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	550	27	577
11 Personnel Compensation.....	16,576	795	17,371
12 Personnel Benefits.....	2,301	240	2,541
21 Travel.....	328	109	437
22 Transportation of Things.....	71	39	110
23 Rent, Communications & Utilities.....	85	1	86
24 Printing & Reproduction.....	372	24	396
25 Other Services.....	2,540	290	2,830
26 Supplies & Materials.....	830	106	936
31 Equipment.....	928	538	1,466
Collections Acquisition.....	13	4	17
32 Land & Structures.....	9	10	19
Total	<u>24,053</u>	<u>2,156</u>	<u>26,209</u>

Analysis of Increase

Necessary Pay.....	436
Program Funds.....	1,720

ABSTRACT - The National Museum of Natural History/Museum of Man (NMNH/MOM) houses what is probably the largest and most valuable assemblage of natural history specimens and human artifacts in the world. The Museum staff is actively engaged in the care, conservation, and study of these collections. The scientists and scholars conduct original research on living and fossil animals and plants; rocks, minerals and

meteorites; and human artifacts to illuminate human biological diversity and cultures, ancient and modern. The Museum shares its work with the scholarly community through publications, symposia, and scholarly exchanges, and with the public through exhibitions, publications, and educational programs. Testimony to the success of the public programs is given by the more than eight million visitors to the Museum in 1987--making it by far the most heavily visited natural history museum in the world. For FY 1989, an increase of 21 workyears and \$1,720,000 is requested: to continue field studies in biological diversity (4 workyears and \$315,000); to provide enhancement of the molecular systematics laboratory of the Museum (5 workyears and \$650,000); to conduct research on the evolution of terrestrial ecosystems (2 workyears and \$100,000); to strengthen the Museum's collection management activities (6 workyears and \$430,000); to accelerate the renovation of the permanent exhibit halls (4 workyears and \$100,000); to establish a permanent American Indian Outreach Program (\$75,000); and to continue planning for the Quincentenary activities (\$50,000). Necessary pay of \$282,000 is required for existing staff, along with 6.25 workyears and \$154,000 required to annualize the partial-year funding of 25 new positions approved in the FY 1988 budget.

PROGRAM - The collections of the National Museum of Natural History/Museum of Man, which contain more than 118 million specimens of plants, animals, fossils, rocks, minerals, and human cultural artifacts, have proven essential to the Nation's scientific community by providing fundamental documentation for the study of man and of the flora, fauna, and geology of our planet and outer space. In FY 1987, approximately 800,000 specimens were added to the collections through gifts, purchases, expeditions of Museum scientists, and deposits from other government agencies. The Museum is responsible by law (20 U.S.C. 59) to serve as the ultimate repository for the collections of natural history, archeology and ethnology gathered by United States government agencies. In addition, it provides laboratory space and research facilities to 80 scientists in affiliated Federal agencies with natural history missions (United States Department of Agriculture, National Marine Fisheries Service, Fish and Wildlife Service, Geological Survey, and National Institutes of Health).

Worldwide Research - Scientific research on the Museum's collections and the publication of scientific findings are fundamental to the mission of the Museum. In FY 1987, more than 2,000 scholars from all over the world visited and used the collections. The Museum's own staff of 120 scientists and 125 resident research associates were engaged in hundreds of collection-based and non-collection oriented research projects. To acquire new information and specimens for this work, members of the staff conducted field research in many countries throughout the world. Among the major FY 1987 expeditions are the following:

--Southeast Pacific: Researchers visited remote, uninhabited Henderson Island, part of the Pitcairn Island group. It is the only elevated coral atoll in the Pacific and Indian oceans that remains relatively undisturbed by human activity. Museum researchers conducted the first modern survey of the Island's unique birds, plants, insects, and other invertebrates, recording the biotic state of the Island as a basis for possible longer-term research.

--Kenya: Museum investigators continued research on early hominoid sites in the southern Kenya rift valley and on Lake Victoria, pursuing information about the ecology and activities of early humans from 1.5 million to .5 million years ago. The fossil remains of an extinct form of elephant were excavated.

--Guyana and French Guiana: Museum field collectors collaborated with other major botanical research institutions in the United States, Europe, and Latin America in a long-term effort to describe little known plant life. A knowledge of indigenous plants is crucial to the intelligent utilization and conservation of the vast natural resources of the tropical forests of the Guianas.

--Scientists now believe the major center of biological diversity on Earth to be in western and northern Amazonia from the flanks of the Andes eastward to the Guianas. With the rich habitats of this region imperiled by accelerating development, the Museum is collaborating with international conservation organizations and Latin American nations to inventory and study unknown plants and animals before they are lost forever. In FY 1987 and early FY 1988, the Museum sent biologists to Beni Biosphere Reserve, Bolivia, and Manu Reserved Zone, Peru, to launch the first in a series of long term biodiversity surveys that will, among other things, identify species of value to mankind and help protect them from extinction.

Conferences and Workshops - The Museum organizes major international symposia to stimulate and facilitate the exchange of scientific knowledge and ideas, and to provide the public with greater knowledge of important scientific research. In addition, it runs training workshops to provide important assistance to the international scientific community. Among the notable FY 1987 gatherings are the following:

--The Museum staff organized an international conference of paleoecologists to document and synthesize information about the long-term stability of ancient terrestrial ecosystems. The findings will help scientists determine whether contemporary ecological disruptions are extraordinary compared with events that took place prior to the appearance of humans on the planet.

--An international workshop brought current information to the scientific and conservation community on the marine and terrestrial research and conservation projects conducted by the Museum on Aldabra. This remote atoll is located in the Western Indian Ocean and is a sanctuary for unique plant and animal species, including the only surviving colony of the Indian Ocean giant tortoise.

--Distinguished scholars from the United States and Canada participated in a public symposium at the Museum on "Americans Before Columbus: Ice Age Origins." The discussions provided the public with new perspectives on how and when humans first entered the New World, what kind of people they were, and their adaptation to conditions both during and after the Ice Age.

--Training of 52 Bolivian and Peruvian participants in the Museum's first Latin America Biodiversity inventory began at the Beni Biosphere Reserve, Bolivia and Manu Reserved Zone, Peru. As the Biodiversity Program expands in future years, hundreds of host-country biologists and conservationists will be trained by the Museum to develop inventories of species in those tropical ecosystems.

Research Publications - Nearly 500 books, major scientific papers, and articles are published every year by Museum scientists. Many of these reports on basic research bear the imprint of the Smithsonian's "Contributions" series. In FY 1987, more than 20 Contributions were issued. These include a dictionary of a Mayan language; a study of the systematics of the crustaceans collected by the 1909-1910 Albatross Philippine Expedition; and systematic papers on bees, ostracods, crabs,

fishes, seagrasses, lichens, crustaceans, Egyptian fossil birds, and the geology and paleontology of the Lee Creek Mine, North Carolina.

Collections Management - The Museum is devoting an increasing amount of attention to managing and conserving the collections to forestall any diminution of their scientific or exhibition value. With the successful completion in FY 1987 of a prototype system in the Division of Fishes, the Museum began a multi-year effort to convert the collection inventory database to a modern, on-line Collections Information System (CIS) being developed in conjunction with the Institution's Office of Information Resource Management. CIS makes possible much more effective use of the collections, facilitating scholarly research and increasing the ability of collections managers to maintain accountability over the more than 118 million collection items.

Ongoing projects continuing in FY 1988 include the move of collections to the Museum Support Center with over 1,400,000 specimen/records having been moved in FY 1987; the cleaning and stabilizing of collection items in preparation for future moves; the incorporation into the collections of about 900,000 new acquisitions acquired in FY 1986; and the maintenance of one of the most active loan and exchange programs of any museum in the world, in which an average of 300,000 items are lent or exchanged annually.

Exhibits - One of the highlights of the many special exhibitions at the Museum in FY 1987, was "Portraits of Nature: Paintings by Robert Bateman," a major retrospective of works by an internationally respected Canadian wildlife artist. The exhibition drew more than 275,000 visitors during its two-and-one-half month run and was a major factor in the Museum's record-breaking 1987 attendance. In conjunction with the exhibition, a Museum book about Bateman's art, discussing its influence on the worldwide conservation movement and written by a staff botanist, was published by the Smithsonian Institution Press. It has now sold almost 50,000 copies nationally and internationally.

Two other popular 1987 Museum exhibitions were "The Far Side of Science," an exhibition of 500 cartoons by Gary Larson, and "From Mud to Museum: The Making of a Dinosaur," an exhibition that allows the public to watch museum technicians extract the skeleton of a 220-million year old dinosaur from a ten-ton block of New Mexican siltstone. The team expects to take as long as two years to unearth, reconstruct, and exhibit the dinosaur.

Under preparation to open in September 1988 is the major international exhibition, "Crossroads of Continents," a cooperative project involving the United States, Soviet Union, and Canada that will showcase historic archeological and ethnographic artifacts from the people of the North Pacific Rim, from Siberia to southern British Columbia.

The Museum has begun initial planning for a new North American Indian Hall that will explain the diversity and dynamics of Native American life and a new Hall of Human Origins that will present the latest evidence bearing on human evolution.

Education - In addition to providing educational activities, programs, and instructional materials to accompany NMNH/MOM exhibits, the Museum's Office of Education has been actively working with students, families, and teachers. The Education staff presented more than three dozen workshops for teachers and museum educators in Washington, D.C., and in communities across the United States. The Discovery Room, a hands-on facility for children, welcomed more than 96,000 visitors

during the year. The Naturalist Center, another specialized learning environment, celebrated its tenth anniversary in FY 1987 by hosting 16,970 amateur scientists, collectors, and artists. The NMNH/MOM Friday Film and Lecture Series presented 39 film programs and 17 lectures during the year. Other educational activities included the following: special programs, activities, and an exhibition created in observance of Black History month and American Indian, Hispanic, and Asian Pacific Heritage weeks; an instructional kit, The Living Arts of India, distributed to universities, museums and schools throughout the United States, and in India through UNICEF; and "Butterflies & Their Flowers," the fourth publication in a new series of instructional charts on plant and animal identification.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 21 workyears and \$1,720,000 is requested: to continue field studies in biological diversity (4 workyears and \$315,000); to enhance the molecular systematics laboratory of the Museum (5 workyears and \$650,000); to conduct research on the evolution of terrestrial ecosystems (2 workyears and \$100,000); to strengthen the Museum's collections management activities (6 workyears and \$430,000); to accelerate the renovation of the permanent exhibit halls (4 workyears and \$100,000); to establish a permanent American Indian Outreach Program (\$75,000); and to continue planning for the Columbus Quincentenary activities (\$50,000).

Biological Diversity (4 workyears and \$315,000) - For FY 1989, an increase of 4 workyears and \$315,000 is requested to continue a series of multidisciplinary and integrated biological diversity studies to gain a better understanding of the composition, functioning, and evolution of natural biotas in tropical regions. The Museum's Biological Diversity Program is the only integrated multidisciplinary program that addresses an inventory of the earth's disappearing flora and fauna in a way that also registers natural changes in population abundance and dispersal. This request will permit expansion of the existing program to include new sites. Because of mankind's dependence on and continued exploitation of natural resources, no other subject is of greater concern to our future welfare. The biological diversity of the earth is disappearing even before it can be identified, catalogued, and studied; and this is especially true in tropical areas. With this in mind, the NMNH/MOM has several new and planned initiatives aimed at gaining a better understanding of the natural biotas in both temperate and tropical regions.

Beginning in FY 1987, the NMNH began collecting specimens and recording the co-existence of botanical, entomological, and other invertebrate species along the arc formed by the western and northern Amazon Basin. National organizations, researchers, and students were enlisted in Bolivia and Peru to join the intensive effort to document the natural history of the area. Hundreds of new plant species, tens of new animal species and tens of thousands of new insect species are on the verge of discovery at present. Smithsonian researchers and colleagues will collect examples of as many of these species as appropriate. These specimens will contribute immeasurably to the reference collections of Latin American universities and museums and to the National Collections of the National Museum of Natural History/Museum of Man. These collections and the studies of them will result in greater understanding of biological diversity, the potential to use these new organisms as food, biological control agents and germ plasm resources. An important aspect of this program is the on-site training of local students by the international cadre of scientists conducting the inventory. These field workshops are vital to cultural and scientific exchange. They have received international attention and ancillary support from the Agency for International Development, World Heritage Program, and the Man and the Biosphere Program at UNESCO. If this program were discontinued, it would result in no one being

able to acquire large scale inventory information in disappearing tropical habitats, especially forest and watershed systems; and the United States would lose its growing leadership position in this important area of biological science.

The Flora of the Guianas portion of the Program has embarked on an energetic analysis of the botanical species in Surinam, Guyana, and French Guiana, and as in the Bolivian and Peruvian project areas, students and local counterpart researchers are participating in the inventory endeavor. International attention is focused on this work especially through the cooperating institutions of the Berlin Botanical Garden, the Natural History Museum in Paris, the University of Utrecht, and the French overseas research establishment in French Guiana.

The increase of 4 workyears and \$315,000 will permit the implementation of a student training component to the flora project and a fellowship position at the postdoctoral level to provide expertise not currently available on the NMNH/MOM staff. Additional travel monies will be necessary for trips to foreign herbaria to make comparisons with type specimens; repositories do not loan type specimens. The project also needs a field vehicle to transport specimens from the collection sites for processing in the closest town, since there are no rental vehicles in the region.

The increase will provide four necessary scientific and administrative positions (\$112,000). Two of the four positions, a research entomologist and a research assistant, must be specialists in tropical insects. They will coordinate inventory field activities and study the collections to produce data for analysis. The data will provide an important link between the established scientific complement of the Museum's Department of Entomology and the pan-bureau multidisciplinary program of Biological Diversity studies. The other two positions are a field manager and a museum technician. The field manager will divide time between the field and the Smithsonian, and will coordinate and facilitate collections and scientific data flow. The museum technician will identify, label, mount, and accession the incoming specimens into the Museum's collection.

The request for travel (\$81,000) will provide for an appropriate level of field work to conduct the inventory. As sites are chosen and base camps are established, the Museum will have to create spartan housing and laboratory support (\$10,000) in regions so remote that none currently exists. As more permanent inventory plots are established in a broader array of tropical conservation units, more latin biologists will be trained. These biologists, in turn, will increase the ability to inventory and gather biodiversity information. It will also be possible to establish more counterpart studies with host-country scientists, linking the United States with other countries in beneficial joint science projects. Additional support is required for contracts (\$62,000), shipping (\$6,000), communications (\$1,000), printing (\$2,000), supplies (\$7,000), and equipment requirements (\$34,000). Equipment requirements include one-time costs for a field vehicle, \$20,000.

Molecular Systematics Laboratory (5 workyears and \$650,000) - This request will provide second-year funding to establish a permanent, sustainable research facility in the rapidly developing field of molecular systematics. Building upon the Museum's broad expertise in systematic and evolutionary biology, and incorporating historical and ecological perspectives, the proposed increase will facilitate the introduction of the molecular study of the genetics of organisms to the largest single group of systematic biologists in the world at NMNH/MOM.

The laboratory will focus on three areas of molecular systematics and evolution. One is that of DNA molecular analysis. DNA molecules are the constituents of genes and may be studied from a number of sources within living organisms (e.g., cellular nuclei, mitochondria, ribosomes) by means of several techniques (hybridization, chemical sequencing). The second area involves the isolating and characterizing biochemical constituents (natural products chemistry), especially of plants and lower invertebrates. This not only allows evolutionary inferences to be made but also the discovery of the structure of naturally occurring compounds of potential usefulness to humans. Finally, the use of electrophoresis investigates the rates at which different characteristic proteins of organisms move apart in an electrical field. This activity is already established on a small scale in NMNH/MOM; it is fundamental to all other more advanced sorts of molecular studies and needs to be expanded.

The Museum of Natural History has the single, largest aggregate of systematic biologists in the world and will eventually provide a Molecular Systematic Laboratory for molecular studies to assess genetic and evolutionary relationships. This laboratory will become the single most important one in the country for systematic research. If funds for FY 1989 are not approved, the Museum will not be able to establish a viable, working facility. However, along with a base of \$250,000, which currently only provides minimal support, the additional funding of 5 workyears and \$650,000 will enable the purchase of the necessary equipment and supplies to establish the laboratory at the Museum Support Center. The long term annual requirement will be for 17 positions and \$1.1 million. Of the \$650,000 requested, personnel funds (\$156,000) will support two additional scientists and three technicians. The balance of the request will provide for supplies (\$71,000) and equipment (\$373,000), and two post-doctoral fellowship appointments (\$50,000). It is anticipated that all the major equipment will be purchased by FY 1990, and the laboratory will be fully staffed by FY 1993. If the additional funds are not provided in FY 1989, the Museum will not have sufficient resources to support basic equipment and supplies for a functioning laboratory.

Evolution of Terrestrial Ecosystems Program (2 workyears and \$100,000) - For FY 1989, an increase of 2 workyears and \$100,000 is requested for collecting base data on terrestrial ecosystems of the last 400 million years. The data will be used to evaluate the effects of large-scale disturbances on the structure of ecosystems and the evolutionary history of organisms.

Over the past several years it has become clear that impacts from extra-terrestrial bodies and climatic shifts, as well as changes in volcanic activity and continental position, have had major, sometimes catastrophic, effects on terrestrial ecosystems. At the same time, humans are creating global-scale disturbances through tropical deforestation and greenhouse effects, and some of the consequences of nuclear war may be analogous to those of large body impacts. The certainty that eventually mankind will face the results of man-made or natural catastrophes makes it of paramount importance to understand the history of terrestrial ecosystems and how they respond to such major changes.

Under the leadership of four curators from the Departments of Paleobiology and Anthropology, the Museum plans to document and analyze the fossil record of terrestrial animals and plants, especially concentrating on intervals before and after extinctions and before the emergence of human influences. This will be carried out by producing, compiling, and analyzing large computer data bases. The data will be displayed and examined using computer generated maps, then analyzed statistically to

test for patterns in the biotic response to different rates and intensities of environmental change through time.

The requested increase will allow the Museum to hire a research assistant and a data entry/administrative assistant (2 workyears and \$53,000), to coordinate data entry, check entries for uniformity, enter data onto the central computer, and manage daily functions. It will also support the enhancement of relational data bases, graphics, and mapping functions, as well as consultation on specific fossil assemblages through contracts and fellowships for a network of university scholars (\$23,000); the purchase of software for data display and analysis (\$10,000); travel for researchers and student fellows associated with the project (\$12,000); and the purchase of basic supplies and materials (\$2,000).

If the funds are not approved, support personnel would not be hired to coordinate and expedite data entry, the program would not be able to acquire needed computer resources, and the acquisition of primary data through collaborative research would be greatly reduced. The immediate effects would be to slow the growth of primary resources--the data base--and to diminish the access of Smithsonian and cooperating scientists to those data. In the longer term, the Museum would be unable to maintain its position of leadership in the study of ecosystem history, and the consequent scientific dialogue with a national and international audience would be diminished.

Through increased interaction with colleagues at other research institutions and universities, future needs will include additional computer equipment, more research-related travel and consultation, and more student fellowships. Beginning in FY 1991, purchases of computer equipment should decrease substantially, but the flow of visiting researchers and students will continue, and the need for one additional research scientist is anticipated.

Collections Management Support (6 workyears and \$430,000) - For FY 1989, an increase of 6 workyears and \$430,000 is requested to enhance the Museum's ability to fulfill its collections management responsibilities. The continued growth in size and importance of the National Collections of the NMNH/MOM and the concomitant increase in collections use by the research community and the public have begun to outstrip the Museum's ability to adequately care for, provide access to, and be accountable for the National Collections and associated data. In 1987 alone, well over one million objects and specimens moved into or out of the Museum as new acquisitions, loans for exhibit and research purposes, or exchanges.

The findings of several external review committees, after examination of collections storage, show that the collections are in severe danger of pest infestation and dust penetration, as well as being housed under non-secure conditions due to the lack of adequate locks. Many of the storage cases have reached a dilapidated condition; and the replacement of these cases is essential to ensure proper preservation of the historically important, valuable, and growing collections housed in the Museum. Steady infiltration of dust through the joints of many of the old cases has already damaged many of the specimens. Meanwhile, the loose or sprung condition of a number of these cases constitutes an invitation to more serious damage by insects and other pests. To correct growing deficiencies NMNH/MOM requests increased support for: additional collections storage equipment, collections and inventory maintenance, and development and enhancement of an improved automated Collection Information System.

A prototype project for one component of the Institution-wide Collection Information System was successfully completed on a small subset of the Museum's collections in May 1987. Further development and implementation of the system will support the efficient building, maintenance of, and on-line access to the Museum's collection data base, the basis for much of the Museum's research and for researchers worldwide.

The requested increase will allow the Museum to hire two technicians to process collections and aid in inventory maintenance, and four information specialists to aid in the design and programming of the automated Collection Information System (6 workyears and \$187,000). Contract programmers will be used during a portion of the system development phase (\$65,000); and in areas where no staff expertise exists, specialists will be hired to process and evaluate collections (\$40,000). A portion of the collections storage equipment acquired will house new collections, but a larger portion will replace seriously inadequate cases that do not protect valuable collections from pests and dust (\$90,000). Additional computer work stations with necessary software will be required to access the Collection Information System (\$48,000). In FY 1990 and following years, additional collections technicians, both temporary and permanent, will be requested for collections processing and inventory maintenance, as will continued funding for the full implementation of the Collection Information System.

Renovation of Permanent Exhibit Halls (4 workyears and \$100,000) - An increase of 4 workyears and \$100,000 will enable the NMNH/MOM to embark on "The Fourth Generation of Exhibits: Building for the 21st Century," a long-term renovation plan for its 30 permanent halls which is estimated to cost \$84 million. The staff and funds requested will assist in continuous upgrading, accelerated renovation, and maintenance to assure the quality of the exhibits and public spaces, the care of the National Collections on display, and the safety and comfort of the visiting public, now numbering more than eight million annually. The American Indian complex is one of the exhibit areas most urgently needing renovation. Planning funds of \$295,000 for these halls were provided by Congress in FY 1988. These funds will be used to update several of the existing displays as well as proceed with design plans for one or more completely new halls. Some of the innovative ideas planned for the new American Indian Hall complex will be tested in the existing halls.

The Museum contains approximately 1,000 individual exhibit units comprising well over 200,000 square feet of exhibit space. With such a large number of visitors per year, the exhibits are subject to rapid and constant physical deterioration and require virtually continuous repair and refurbishment to uphold Smithsonian standards and to assure the safety of the visiting public. A second goal of the funding increase is to improve the basic visitor experience of the Museum through the improvement of visitor support services and public amenities, that are in need of immediate attention.

Many of the permanent halls in the Museum are more than 30 years old. The increases in staff support and resources made possible by a program increase will not only allow the Museum to maintain and upgrade the physical condition of the Museum, but will also enable the Museum to modernize the existing cases, labels, photographs, and other display items to assure that the most modern and accurate scientific information is presented to the public.

This increase will be added to the Museum's base budget of approximately \$1.6 million for permanent exhibits. Personnel costs for a designer, cabinetmaker and two

technicians total \$91,000; the balance of the request will support services (\$6,000); and supplies and materials (\$3,000).

The Museum will continue to request further increases for some years to come for necessary updating. A reduction to this request will compromise seriously the Museum's efforts to renovate and maintain exhibition areas. Even with approval of these funds, it will be necessary to raise additional funds from the private sector to modernize the Museum's many antiquated halls in a reasonable period of time.

American Indian Outreach Program (\$75,000) - For FY 1989, an increase of \$75,000 is requested for program activities of the American Indian Outreach Program at the NMNH/MOM. The American Indian Program has two staff positions and a non-salary budget of \$20,000. The Program is an outreach effort designed to support research by and about American Indians, to make the resources of the Smithsonian more accessible to Indian people, and to increase cooperation between Smithsonian and American Indian communities throughout the United States. An increase of \$75,000 is requested for the initiation of two tribal catalogues, two traveling exhibitions and associated expenses in addition to what is currently underway.

Collaborative projects between American Indian communities and scholars and the Smithsonian are one of the priorities of the program and tribal catalogues for the Kiowa and Crow tribes are now in process. The Zuni and Choctaw catalogues are currently under discussion and preliminary work will start in the summer of 1988. A tribal catalogue is an exhaustive description of all materials in the Smithsonian collection relating to a particular tribe. The research will be done by members of that tribe and all objects in the Smithsonian collection attributed to that group will be photographed. Only some of the photographs will be printed in the catalogue, but a complete set of all photographs will be given to the tribe and another complete set retained for the Smithsonian. For large collections, such as the Zuni and Navaho collections, it is possible that a video disk containing images plus historical data pertaining to a tribe's holdings can be produced.

Other cooperative projects would involve traveling exhibitions based on the Smithsonian collections and developed in cooperation with tribes and Indian organizations who would use them. Such an exhibit on the subject of the United States Constitution and the right of Indian people to vote is currently being discussed with an inter-tribal organization in the Southwest. An exhibit developed in the Program on the subject of Plains Indian Art will be touring the country for several years through the Smithsonian Institution Traveling Exhibition Service. The exhibit program will make it possible for Indian tribes to initiate a collaborative exhibition designed to fit locally defined educational needs. It will strengthen tribally controlled educational and cultural institutions, i.e., schools and museums, and create a mutually beneficial working relationship between tribal groups and the Smithsonian Institution. The American Indian Program will facilitate access to and involvement with Smithsonian collections by Indian tribes and individuals and will be part of a larger effort by the Department of Anthropology to document the collections. The proposed support of Indian delegations who visit the collections will be an important component of an overall coordinated effort by this Program of the Department of Anthropology to increase and sustain Indian involvement with the Museum of Natural History.

The \$75,000 will provide supplies for exhibit preparation for two suitcase exhibits at \$15,000 each, which will cover all the material and shipping costs (\$30,000); two contracts at \$15,000 for research on the tribal catalogue series

(\$30,000); printing and photographic services for the tribal catalogue series (\$10,000); travel (\$2,000); and storage and processing equipment for the tribal catalogues and traveling exhibits (\$3,000).

Columbus Quincentenary (\$50,000) - For FY 1989, an increase of \$50,000 is requested to continue the Museum's research, planning, and development for its part in the Institution's commemoration of the Quincentenary. Together with a base of \$80,000 for Quincentenary programs, this request will support one program manager, archeological field work, exhibit research and advisory committee travel, design and workshop support, and two upcoming symposia on Latin American archeology (FY 1988) and the "Impact of Contact on Native Biotas" (FY 1989).

The NMNH/MOM Quincentenary Program Office is working on four major projects. All of these projects require the cooperation and support of various departments within the Museum as well as other bureaus and offices of the Smithsonian. Working with the program director, a senior historian on the Museum staff, is a Museum steering committee and a distinguished advisory committee composed of scholars from the Smithsonian and the academic community at large. The Museum's exhibition and program plans are the result of new research in natural history fields as well as reinterpretations of already existing materials. This information will be disseminated through public educational programs, exhibitions, publications, and scholarly symposia. Because the subject matter deals more with concepts than objects, the Museum will be employing new and innovative exhibit techniques to heighten the impact of the story. The exhibition and programs will involve and relate to various minority groups, including blacks, American Indians, and Hispanics.

The requested increase will enable the Museum to continue working to produce a major, temporary exhibition (15 months) for the Evans Gallery, to open October 12, 1991; to produce a major publication on the exhibition with contributions from the advisory committee; to sponsor five symposia in 1988, 1989, 1990, 1991, and 1992; and to support an archeological reconstruction as part of the exhibition.

The planned exhibition, "Seeds of Change," presents the Old and New Worlds as a series of ecosystems into which the "seeds" of change were dropped. Radiating around the globe like the ripple of pebbles thrown into a pond, these "seeds"--maize, sugar, small pox, potato, and the horse--have a far-reaching and dramatic impact not only on the people but also the flora and fauna of both the Old and New Worlds.

In FY 1989, the increase of \$14,000 for travel will be used to send staff members to various museums and learned society meetings to learn what other institutions are planning for the Quincentenary; to allow staff members and researchers to visit new, innovative exhibits; to allow for research at other sites within the Americas and England; and to bring symposium participants to Washington, D.C. In FY 1990, the Museum will be requesting funding for travel at the same level for this program.

Shipping support (\$3,000) will be used to begin bringing artifacts to the Museum for use in the exhibition. Printing funds (\$12,000) will allow NMNH/MOM to begin work on layout design for the catalogue, brochure, checklist, and for the production of "working" photographs to be used by the designer. The increase of \$14,000 for other services includes design fees for work on the exhibit, publicity, promotional material, and educational publications as well as contracts for outside advisors (e.g., an education specialist and conservators). An increase of \$3,000 is needed for supplies and materials. The increase of \$4,000 (\$3,000 base in FY 1988) for the acquisition of collections will be used to purchase from private collectors, print

shops, book sellers, etc., engravings, books, and art objects identified as pertinent to the Museum's exhibits.

The total \$50,000 increase is necessary for the Museum's Quincentenary Office to continue its work. Without the funds, the design stage of the exhibit planning cannot begin, the planned symposium cannot be sponsored, and the assistance of outside experts and consultants cannot be sought. A strong base of Federal support is important to attracting additional and necessary private funding.

NONAPPROPRIATED SOURCE OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are derived from a variety of sources, including annual allotments for specific purposes; the Museum's share of net proceeds from the Museum shop, cafeterias and other receipts, such as sale of exhibit brochures; the "By-Word" exhibition explanation system; and tuition reimbursement grants from local universities for courses taught by Museum staff. Program allotments provide support for events related to the opening of new exhibitions, as well as salary and benefit costs for the director of the Museum. In FY 1987, allotments were provided for emergency costs related to a diving accident off the coast of mainland China and for partial support toward the purchase of an analytical scanning electron microscope for the Department of Mineral Sciences. In FY 1987 and FY 1988, an allotment provided temporary support for a new research program on the evolution of terrestrial ecosystems, documenting the characteristics of ecosystems before and after major environmental disturbances and the emergence of human impacts. Special Purpose funds are used to help finance exhibit hall brochures, the repair and replacement of exhibit hall audiovisual equipment, benches and carpeting, field research, docent travel costs, duplication of human studies films, training of anthropology students, and support for the Anthropological Archives.

In addition, funds from the Institution's Collections Acquisition Program, Scholarly Studies Fund, Educational Outreach Program, Research Opportunities Fund, Smithsonian Society, and the Special Exhibition Fund support research, education and exhibition projects. Among the Institutional funds received during FY 1987 were awards to produce two films to be included in the "Crossroads of Continents" exhibition and a planning grant to update the Insect Zoo's current exhibits. In FY 1987, the total funding from these programs amounted to \$843,000, providing various levels of support for many projects. Expenditures under these programs have not been recorded for FY 1988 and FY 1989, which explains the variance in totals shown between FY 1987 and the subsequent two years.

Restricted Funds - These funds are in the form of restricted endowments which specify the use of the donation or bequest and of gifts and grants provided by individuals, foundations, and corporations for specific purposes. Generally, the funds provide support for a particular exhibition or research project. Among these restricted funds are field-based and laboratory research on the origin of the Nile Delta supported by Texaco and ecological studies of mangrove swamps funded by Exxon. Other funding is available from an employee's contribution for ethnological research among the Canela Indians of Brazil. The International Union for the Conservation of Nature and Natural Resources provides support for the study of threatened Latin American plants. The Museum received funds from the Donner Foundation for the Human Origins Hall. Funds also were received from Mill Pond Press and Cadillac Fairview Corporation toward production of "Portraits of Nature: Paintings by Robert Bateman." All Nippon Airways funded the exhibit opening and other expenses related to the Gary Larson exhibit. Funds are being sought for the renovation of the popular Insect Zoo.

The Museum continues to seek support from private sources for its planned exhibitions and outreach programs. Currently, funds are being sought for a new North American Indian Hall, a new Human Origins Hall and for upgrading the Gem and Mineral Hall. Fund-raising efforts continue for "Seeds of Change," the Museum's Quincentenary exhibition.

In FY 1982, the Museum undertook the management of the Smithsonian Marine Station at Link Port, Florida (formerly called the Fort Pierce Bureau), as an integral part of its marine research program. The Hunterdon Endowment supports oceanographic research at this facility, which offers an unique environment in which to study an oceanographic transitional zone between temperate and tropical biotas. Research focuses on the life history, systematics, and ecology of a wide spectrum of plant and animal marine life. Contributing to the research efforts are a resident scientist, Smithsonian visiting scientists, postdoctoral fellows and numerous national and international visiting investigators. Support is also provided by the Seward Johnson Endowment Fund for operation and maintenance of the Johnson-Sea-Link submersible program conducted at the facility by the Harbor Branch Oceanographic Institution (HBOI). Recently a long-term lease agreement was signed between the Smithsonian and HBOI for land upon which a Smithsonian laboratory and residential facility could be constructed. Funds are currently being sought to cover these construction costs.

Government Grants and Contracts - These funds are provided by various government agencies and departments for special projects which can be conducted at the Museum because of its unique scientific expertise in certain fields. Examples of continuing government contract support are projects funded by the National Institutes of Health to support bone pathology research; the "Tumor Registry in Lower Animals" project funded by the National Cancer Institute, which facilitates the study of neoplasia and related disorders in invertebrate and cold-blooded vertebrate animals important in human biomedical research; and funds to curate material collected during the Bureau of Land Management's outer continental shelf biological sampling program in the Atlantic and Gulf regions.

NATIONAL AIR AND SPACE MUSEUM

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	218	8,940	1	155	42	3,022	2	535	7	581
FY 1988 -Estimate	212	9,005	3	236	45	3,301	2	890	7	360
-Base	212	9,118								
FY 1989 Estimate	216	9,497	3	261	44	3,427	2	622	5	291

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	212	4	216
11 Personnel Compensation.....	6,361	205	6,566
12 Personnel Benefits.....	928	61	989
21 Travel.....	76	15	91
22 Transportation of Things.....	49	-	49
23 Rent, Communications & Utilities.....	20	-	20
24 Printing & Reproduction.....	152	-	152
25 Other Services.....	639	5	644
26 Supplies & Materials.....	408	33	441
31 Equipment.....	485	60	545
Total	<u>9,118</u>	<u>379</u>	<u>9,497</u>

Analysis of Increase

Necessary Pay.....	118
Program Funds.....	261

ABSTRACT - The National Air and Space Museum (NASM) serves as an international research center and repository for artifacts and documentation related to the development of aviation, space flight and space science. Through its exhibitions, research, preservation/restoration, and education programs, the Museum serves a wide public and scholarly audience interested in the history and technological achievements of aviation and space flight. In addition to its Mall location, NASM maintains a facility for the preservation and restoration of artifacts at the Paul E. Garber

Preservation, Restoration and Storage Facility in Suitland, Maryland. For FY 1989, an increase of 4 workyears and \$261,000 is requested to conduct original scholarly research in the history of aviation (2 workyears and \$125,000); support the Museum's collections management programs (2 workyears and \$125,000); and continue the development of a World Atlas composed of satellite images in commemoration of the Columbus Quincentenary (\$11,000). Necessary pay of \$118,000 is required for existing staff, along with 0.25 workyears and \$6,000 required to annualize the partial-year funding of one new position approved in the FY 1988 budget.

PROGRAM - Established by law on August 12, 1946, NASM's role as a national resource for public and scholarly interest in the air and space fields was greatly strengthened by the completion of the current museum building on the Mall in 1976. More than 110 million people have visited the Museum since it opened, making it the most popular museum in the world. NASM's collections consist of more than 300 historic aircraft, 250 spacecraft and extensive holdings of artifacts, papers, photographs, films, microfiche, video disc and technical drawings, which are available for study by interested scholars throughout the United States and abroad.

The exhibition program uses state-of-the-art techniques in design, presentation and equipment to convey the excitement of the subject matter to the visitor. An active scientific program, aimed at understanding both Earth and planetary geology, continues as an important endeavor of the Museum. Active programs in collections management, preservation and restoration of artifacts remain a centerpiece of the Museum's curatorial efforts. As a public institution, considerable emphasis is placed on the education and outreach activities through lectures, films, planetarium presentations, docent tours and written materials for schools and visitors to the Museum. During FY 1987, the Museum was reorganized to achieve greater balance between research, exhibitions, education, and collections management functions.

NASM maintains exhibits preparation, collections storage and management, and preservation and restoration programs at the Paul E. Garber Facility in Suitland, Maryland. The Museum has restored more than 60 historic aircraft and spacecraft from its collection at the Garber Facility, with the restoration of additional artifacts planned each year. The Garber Facility also presents to the public approximately 90 aircraft, numerous spacecraft and other flight-related objects. During 1987, approximately 30,000 people visited the Garber Facility.

Research - Research provides the foundation of the Museum's efforts as a primary center for the study of the science and technology of aviation, space, and geophysical science. The results of research projects also support the exhibitions, publications, educational, historic restoration, and archival preservation programs. The areas of research undertaken by the Museum staff include the history of space science and exploration; the history of aeronautics; contemporary developments in these fields; and comparative studies of the Earth and other planets using satellite images and data. In addition, the Museum supports two applied research and development programs: the historic preservation of aircraft and spacecraft, and the storage and retrieval of archival and photographic information.

Aeronautics: The new History Book Series which includes scholarly monographs treating various aspects of aeronautical history, reprints of major works currently out of print and translations of major works by foreign authors began in FY 1987. The goal is to attract to the Museum and the Smithsonian Press the highest quality manuscripts produced by scholars working with the Institution. To lead off the

series, the Museum will be re-publishing books which are now out of print, but are considered classics of aviation history.

The Air and Space Bibliography project represents an important joint program with the Space Science and Exploration Department and the Aeronautics Department. When published in FY 1988, this bibliography will become a major source for annotated reference dealing with aerospace history.

Research and writing continue on a number of books to be published in FY 1988 and upcoming fiscal years. These include Igor Sikorsky, The Russian Years, U.S. Women In Aviation 1940 - Present, The Boeing 247, The Wright Flyer, and Igor Sikorsky Centennial 1889 - 1989.

Exhibitions in the research stage in FY 1988 include the Sea-Air Operations Gallery that will highlight the six major aircraft carrier battles in the Pacific during World War II with a special tribute to the USS Enterprise, the most decorated carrier of the War in the Pacific. This revision also will include modern carrier aviation. A major new gallery on World War I aviation emphasizing the emergence of air power and the use of aircraft as a weapon of war also is being researched.

Space Science and Exploration: The Museum's joint program of research and documentation of the Hubble Space Telescope with The Johns Hopkins University History of Science Department will serve as a rich source of research material for historians in the future, and will provide a valuable current record of space technology. Research also is being conducted on the history of scientific research using satellites, the history of the interaction of aerospace and computing technologies, the history of spacesuit technology, weather satellites, and the history of the Soviet space program. The Space Astronomy Oral History Project (SAOHP) has published a catalogue and continues to augment that collection with new interviews. To date, over 350 copies of the SAOHP catalogue have been sent upon request to outside scholars from many different institutions and the interest in the program has resulted in requests to conduct colloquial and instructional sessions on oral history techniques for outside groups. A wide scope of issues in space history has been added to the SAOHP. The success of the oral history program has stimulated interest in experimenting with video histories, and has led to the funding of a pilot video history program by the Sloan Foundation. The planned four-year, pan-Institutional program began in FY 1986 with the establishment of a framework outlining the goals of the program. In FY 1987, a large number of interviews were conducted with senior administrators who were key to the development of the Nation's space program, as part of the Glennan-Webb-Seamans Fund for Research in Space History. This fund, established in FY 1986, supports a broad program in historical preservation and scholarship with emphasis on administration and management in the Nation's space program. Presently, this fund is supporting a cooperative effort to assist the Rand Corporation in developing a corporate history program highlighting their contributions to the history of the space program. In FY 1988, a comprehensive survey of resources for the study of space history in the Washington, D.C. area will begin in cooperation with the National Aeronautics and Space Administration (NASA) and the U.S. Air Force (USAF) History Office.

Earth and Planetary Studies: The Center for Earth and Planetary Studies was established in 1973 to conduct research in comparative planetology and in the development of the Earth's land forms and surface composition by analyzing remote-sensing data obtained from satellites. Research analysis of remote-sensing data uses scientific information gathered by satellites and analyzed by computer to produce

geological and topographical studies of areas on the surface of the Earth, the Moon, and other planets. Research projects on satellite remote-sensing of desert fringe regions are geared towards the understanding of the effects of climatic change on surface materials in the Sahelian zone of Africa. Field work has been done in the inland Niger delta of Mali, in western Egypt, and in northern Sudan. By combining recent satellite images with those taken 14 years earlier, researchers are better able to assess the movement of sand and soil degradation that has taken place due to the recent period of drought. Research in mapping and analyzing the origin of surface features on the Moon and Mars continued throughout FY 1987 and FY 1988, with continued funding by the National Aeronautics and Space Administration.

In FY 1983, NASA designated the Center for Earth and Planetary Studies as a Planetary Image Facility, a repository allowing researchers access to the collections of images of the planets taken by NASA space probes. During FY 1987, researchers from the Smithsonian and other institutions continued to make great use of this facility. Plans are now under way to link the Planetary Image Facilities across the country beginning in FY 1988 so that this valuable information can be easily shared.

Exhibitions - The major gallery "Looking at Earth" (which opened in FY 1986) has received the General Electric Edison Award for Excellence in Lighting Design. This gallery, chronicling efforts to see the Earth from higher vantage points to study Earth's changing surface, from early attempts using birds and kites to the present use of spacecraft and satellites, also marked the first use of interactive video technology for exhibition purposes at the Smithsonian. By touching the screen and picking out an area within the United States, the visitor can view a Landsat photo of their hometown area.

In FY 1987, the spectacular full-scale replica of the Tracking and Data Relay Satellite (TDRS) was suspended in the Space Hall. The TDRS system, which will eventually consist of three satellites and a ground station, has served as NASA's world-wide space communications network since 1983. The Caproni CA9, the first Italian Air Force airplane, went on display in the Early Flight gallery; and a completely restored Spad XIII went on display in the World War I gallery. Additional exhibitions completed in FY 1987 include IRAS, the infra-red astronomy satellite; "Into the Sunlit Splendor, the Aviation Art of Bill Phillips"; and an update to the "Friendship 7" exhibit in commemoration of the 25th anniversary of the history-making flight of this spacecraft. In August 1987, the Museum became the proud recipient of the Voyager aircraft. This historic aircraft, the first to fly non-stop and unrefueled around the world, is exhibited in the Independence Avenue lobby of the Museum. Also in FY 1987, the "America's Space Truck" exhibit was updated to include an interactive audio-visual for information on space shuttle missions and crews.

Exhibitions scheduled to open in FY 1988 include the "U.S. Customs Service"; "Robert Taylor Art Show"; and "Women In Helicopter Aviation." Also planned for FY 1988 is the display of the Hubble Space Telescope Structural Dynamic Test Vehicle. This authentic artifact was used for full-scale testing under varying conditions to simulate the effects of space conditions on the space telescope in preparation for its launch aboard the Space Shuttle.

During FY 1989, the Museum's most ambitious exhibition to date, "Beyond the Limits: Flight Enters the Computer Age," will open. This major gallery, which will trace the development and use of computers in aviation and space, will include such features as hands-on displays for the public to experience, interactive video units, a state-of-the-art theater and a working robotic arm. An upgrade to the Sea-Air

Operations Gallery, including an expansion of the Ready Room, is also planned for FY 1989.

In FY 1990, a major new gallery entitled "The Emergence of Air Power" will open. Emphasizing the use of aircraft as a weapon in war for the first time, this gallery will demonstrate the overall emergence of air power.

Exhibitions are complemented by film presentations related to air and space travel in a specially equipped theater which uses an innovative, high-resolution projection system (IMAX) and a giant screen for extraordinarily realistic effects. The latest IMAX film, "On the Wing," which premiered in June 1986, presents a comparison of natural and mechanical flight featuring a mechanical replica of the flying reptile Quetzalcoatlus northropi. Another recent IMAX film, "The Dream is Alive," featured actual film footage shot by the astronauts on three Shuttle missions. A new film project now being developed, tentatively titled "The Blue Planet," will include never before seen film footage shot by the astronauts on earlier Shuttle missions and future missions, plus numerous still photographs of our beautiful planet Earth, taken from space.

Development of Collections - In FY 1987, the Museum acquired an Arrow Sport A2-60 aircraft (a 1928 depression-era, two-seat biplane built for the general aviation market which is still in flying condition); a Nelson PG 185B Hummingbird airplane, the first powered sailplane of a series that did not have to be towed into the air by another aircraft; a Vought RF-8G Crusader aircraft (the last Crusader aircraft decommissioned from U.S. Navy service); a de Havilland Chipmunk aerobatic aircraft; a collection of memorabilia donated by Brigadier General Charles E. Yeager, USAF (Ret.), consisting of 200 items ranging from uniforms, medals, trophies, and personal memorabilia; a collection of nine aircraft engines from numerous sources and manufactures, including an Avco Lycoming high bypass engine, Rolls-Royce Conway, Derwent, and Viper engines, Wright Ram Jet RC2-60 engine, and Pratt and Whitney J60-R6 and TF30P-6-E engines; and a piece of the original fabric from the Curtiss NC-4, which was the first aircraft to fly across the Atlantic.

In FY 1988, acquisitions included the Lockheed T-33A, a jet trainer used by all branches of the military; a Lockheed Super Constellation, a 4-engine propeller driven airliner; and a Junkers Ju 52, a long-used and highly-acclaimed transport used by European and South American Airlines.

In FY 1987, important astronomical artifacts acquired included the Hubble Space Telescope Structural Dynamic Test Vehicle (a high quality mock-up that was used from 1972 to the present to develop and evaluate the design of the Hubble Space Telescope and its handling procedures); a collection of awards and memorabilia of Michael Collins (one of the astronauts who flew on the Apollo XI mission and who later served as the director of NASM from April 1971 to April 1978); Memorial Plaque, 51-L (a flag and mission emblem patch recovered from the Shuttle Challenger after the explosion); and a Space Shuttle Remote Manipulator System (a non-flight mechanical arm similar to those used on shuttle spacecraft to deploy and retrieve satellites). Additional space artifacts are continually acquired from NASA missions. In FY 1988, the Museum acquired an X-29 forward swept wing full scale aircraft model, and a Cray 1 Computer, the world's first super computer, to be included in the exhibit "Beyond the Limits: Flight Enters the Computer Age."

To date, NASM has acquired 10,000 feet of duplicate footage of original aviation newsreel footage produced by the Movietone News Company from 1919 to 1939, covering

topics such as Charles Lindbergh and his Lockheed Sirius, the Spirit of St. Louis arriving at the Smithsonian Institution, Jack Northrop and the original flying wing and the Women's Air Derby of the late 1920s. This extremely valuable footage (part of the collection of 800,000 feet of Movietone newsreel film on aviation currently owned by the University of South Carolina) was produced on nitrate film. Under the terms of an agreement signed with the University in FY 1986, the Museum will retain a master negative and duplicate positive film copy of any nitrate film footage transferred to safety film and return a positive copy to the University for their collection. The goal is to save all of this historically valuable material for future generations.

Preservation and Restoration of the Collections - Restoration is continuing in FY 1988 on the Arado 234, the first jet bomber, and the OS2U Kingfisher, which was carried on battleships and cruisers for aerial reconnaissance. Scheduled for completion in FY 1988 are the Fowler Gage Tractor, a wooden aircraft built in 1912; the forward fuselage of the Enola Gay B-29; and the ATS-6 applications Satellite. Additional restorations beginning in FY 1988 include a HS-293 Glide Bomb, a German WW II missile; a WW II French Caudron Bomber, the first airplane designed primarily for bombing; a British Hurricane, a significant fighter in the Battle of Britain; a Japanese Shinden, an advance design canard fighter interceptor; the Hubble Space Telescope model; and the Mariner 10 structural/thermal engineering model, used to test structure and temperature stress. The treatment program initiated in FY 1983 to reduce further deterioration of aircraft remains the heart of the restoration program.

The Space Science and Exploration Department's Artifact Preservation Group has completed its fifth year of providing information and guidance in the areas of artifact preservation, exhibition, care and handling. This program has created an awareness of the special problems related to space artifacts that were designed and constructed based on a one-time use in zero-gravity environments without oxygen and were not intended for extended storage or display on the Earth's surface. In FY 1987, a one-day workshop was conducted on the packing and crating of museum artifacts for shipment. This workshop featured Blues Farley from The Philadelphia Museum of Art and benefited many organizations throughout the Institution.

Video Disc Project: This preservation program for archival photographs and other visual collections consists of filming the images on 35mm film and then transferring this film onto video disc format. Currently, over 500,000 images have been transferred and five discs have been completed. The fifth disc, completed in FY 1987, contains NASA material including 70mm color photos taken from the Space Shuttle. By facilitating greater access to the collection and eliminating the loss or destruction of the originals, this project has expanded the availability of these vast collections to scholars throughout the world. In FY 1988, the Museum plans to complete the sixth disc containing images from all the lunar probes (Ranger, Surveyor and Apollo missions), including views of rock and soil samples. Many of these images are part of NASA's collection.

Development of the System for Digital Display: Utilizing the most advanced technological innovations in computer and video technologies, the Museum has successfully put together the first three production systems. The ability to translate any historical document into digital format and produce a printed copy of the text has already been tested. The digitizing of the Von Braun papers in Huntsville, Alabama (undertaken as the pilot project), was successfully completed. In FY 1987, the papers of James Webb, Administrator of NASA from February 1961 to October 1968, were digitized at the Truman Library in Kansas City, Missouri.

The Visual Inventory Control (VIC) system developed in FY 1986 and used to digitize a three-dimensional object or picture in full color with high resolution and an accompanying text will be used for inventory management both in the Museum on the Mall and at the Garber facility.

Public Education and Orientation - The Museum's educational programs continued to expand in FY 1987. With the addition of two new education specialists, the development of the Education Resource Center began. This center, opening in January 1988, is modeled after NASA's Teacher Resource Centers, and with NASA's support, will provide slides, video tapes, photographs, and written materials to educators on aerospace related topics. Numerous educational workshops for teachers were held throughout FY 1987 covering such topics as Weather, Astronomy and Manned Spaceflights. In FY 1988, the more popular workshops will be repeated. Curriculum materials for "Looking at Earth" and "On the Wing," and a Space Shuttle Activity Book were also completed in FY 1987. Curriculum materials revised and developed in FY 1988 include "Discovery," "History of Flight," "Exploring the Planets," "Exploring Space," "The Dream is Alive," and "5, 4, 3, 2, 1, a Self Guide for the Young Visitor." The "Milestones of Flight" filmstrip is being converted to videotape for wider classroom distribution. A teacher advisory board will meet at the Museum in late FY 1988 as will members of the Regional Resource Program. In FY 1987, 32 members participated in the Regional Resource Program and recruiting will begin in Spring 1988 for the August workshop.

Beginning in FY 1988, the Museum started a new educational outreach program aimed at minority students in the local community. This program will provide speakers and educational materials directly to the classrooms of elementary and middle level schools. A series of educational museum activities have begun already in cooperation with the Anacostia Museum. An educators' newsletter, Skyline, has been produced and distributed to teachers across the country.

The Office of University Programs was created in June 1985 to support the academic focus of the Museum. In FY 1986, the cooperative program between NASM and New York University completed its second year, bringing History of Science undergraduate students to the Museum to conduct a portion of their course work and receive hands-on experience working with museum artifacts. Expansion of this program includes liaison with The Johns Hopkins University, Cornell University, the Massachusetts Institute of Technology, and Wellesley College. During January 1987, Museum curatorial staff conducted a two-week course on the history and principles of flight for 15 Wellesley students, using the collection as a teaching tool. University cooperative programs have expanded in FY 1987 with a grant from the Sloan Foundation for the development and presentation of a workshop in January 1988 and videodisc and curriculum packages for liberal arts colleges and universities.

Air and Space magazine was launched in FY 1986 as a bimonthly publication. The magazine was founded by the Museum to provide an educational and informative forum for broad issues on aviation and space topics for the lay public. Market research over a period of months indicated a higher than average appeal for a magazine of this type, and the renewal circulation continues to prove promising. It is planned to eventually make Air and Space a monthly magazine.

NASM continues to present numerous series of free lectures, seminars, symposia and films to the public. These include the General Electric sponsored aviation lecture series, which in FY 1987 included Brigadier General Charles E. Yeager, USAF

(Ret.); Top Gun Commander Rick Ludwig, USN; Harold Pareti, founder of Presidential Airways; Colonel Steve Ritchie, the only Air Force ace since the Korean War; and Air Vice-Marshal Ronald Dick, Royal Air Force, who lectured on the night bombing raids over Europe. The 10th annual Von Braun Memorial lecture in May 1987, "Outward Bound: The Extraterrestrial Century," was presented by Dr. Thomas O. Paine. The Charles Lindbergh Memorial lecture was given by Lt. General Benjamin O. Davis, Jr., USAF (Ret.). Other highlights in FY 1987 included a symposium "Messages from the Universe" and lectures by Pierre Clostermann, a Frenchman in the R.A.F., and Senator John Glenn, commemorating the 25th anniversary of his flight in "Friendship 7." The Exploring Space Lecture Series included such topics as "Star Formation and Stellar Demise"; "Born in the Milky Way"; "A Universe of Galaxies"; and "Extragalactic Violence: Quasars in the Distant Universe." The film series continued in FY 1987 showing some very popular movies including "TopGun," "The Right Stuff," "The Bridges at Toko-Ri," "Twelve O'Clock High" and "The Dawn Patrol."

In FY 1988, the Museum presented a public lecture and symposium in cooperation with NASA on the "25th Anniversary of Mariner 2" with Carl Sagan as one of the guest speakers. The Von Braun Memorial lecture in January 1988 will be presented by General Samuel C. Phillips, USAF (Ret.) on Managing the U.S. Space Program. Rudy Opitz, a former Squadron Commander of Messerschmitt Me 163's, will be speaking about these rocket-powered fighters as part of the 1988 General Electric Lecture Series.

Publications - In FY 1987, the Museum published The Wright Flyer: An Engineering Perspective and Focke Wulf 190: Workhorse of the Luftwaffe. Planned publications in FY 1988 include The Air and Space Bibliography; Boeing 247, part of the famous aircraft series; U. S. Women in Aviation: 1940 - Present; Space Suits in the National Collection: Clothing for Exploration; Stratospheric Science; Rebels and Reformers of the Airways; and Practical Astronomy. Plans are underway for the following publications in FY 1989 and beyond: Igor Sikorsky's Giant Aircraft; 1903 Wright Flyer, part of the famous aircraft series; Soyuz; The Commuter Airlines of the U.S.; Our Weather from Above; Beyond the Limits: Flight Enters the Computer Age; and a catalogue of the NASM Art Collection.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 4 workyears and \$261,000 is requested to conduct original scholarly research in the history of aviation (2 workyears and \$125,000); support the Museum's collections management programs (2 workyears and \$125,000); and continue the development of a World Atlas composed of satellite images in commemoration of the Columbus Quincentenary (\$11,000).

Historical Research - Aeronautics (2 workyears and \$125,000) - For FY 1989, an increase of 2 workyears and \$125,000 is requested to supplement existing areas of expertise in the Museum's Aeronautics Department and to enhance current ongoing research projects. This enhancement of the Department's research capabilities, part of the Museum's efforts to achieve greater balance between research, exhibitions, education, and collections management functions, will also build upon the Department's recent efforts to conduct more comprehensive research on the history of aeronautics and on its role in the broader context of United States and world history.

These recent efforts are illustrated in the development of the new World War I Gallery, "The Emergence of Air Power." Research for the exhibition will focus on the social and cultural impact of the world's first experience with global war. This research will not only trace the development of aerial strategy and tactics (some of which are still in use today), but also will study the lasting impact of the first World War and its monetary, manpower, and psychological costs to society. Other

recent examples of the expanded role of historical research in exhibitions and publications include the complete documentation of the history of the Wright Flyer, which will result in a definitive publication including valuable new information discovered during the recent restoration of this historic aircraft; and the publication of research on the Boeing 247, which will not only trace the history of the first modern airliner, but also the emergence of commercial aviation in the 1930s.

The increase requested for FY 1989 represents the first phase of the planned enhancement to these ongoing historical research efforts. This funding will enable the Museum to eliminate current gaps in staff expertise in flight management systems (which is the science and technology of the application of electronics to the fields of aeronautics and astronautics) and in the history of technology. Part of the requested funds will enable the Museum to hire two senior level curators/historians in these fields.

The Museum has growing flight management systems and instruments collections, which are very important to the Museum's mission of preserving the technology of the aircraft that shaped aviation history. The Museum is currently not able to give proper care to these collections or develop them as comprehensive research collections, since there is no curator in the Department with this expertise. The importance of addressing this need is underscored due to the application of sophisticated computer technology to the development of these instruments, which has resulted in a new generation of "high-tech" flight management systems. A senior level curator/historian (1 workyear and \$50,000) is needed to care for these collections; negotiate donations, trades and loans to enhance the collections; and perform original research resulting in scholarly monographs and journal articles.

In addition, a historian of aviation technology (1 workyear and \$50,000) is needed to keep up with the very rapid technological advancements in military and commercial aviation. A historian will supplement the Department's current engineering expertise by establishing a historical research capability in this area. Progress in aviation technology has been so rapid that a senior historian is urgently needed to record and publish on these advances.

Finally, increased funding is requested to support the Department's research support costs, including the purchase of computer equipment (\$15,000) and travel (\$10,000). In FY 1990 and following years, it is anticipated that additional staff and support funding will be requested to continue to reinforce the Department's research capabilities.

The Museum's increased emphasis on research will strengthen its ties with other academic and museum enterprises, both domestic and foreign, in common areas of interest. Without these additional funds, large gaps in these areas of expertise will continue to hamper the Aeronautics Department's historical research and planned research for upcoming exhibitions, such as "The Emergence of Air Power."

Collections Management Projects (2 workyears and \$125,000) - A new Collections Management Division was established as the result of the Museum's recent reorganization. One major goal of this new division is to gain better physical and intellectual control over its document and audio-visual collections through implementation of a formal archival program. This effort is compatible with the Secretary's emphasis on applying modern technologies and methodologies to collections management, conservation and preservation programs. NASM's archival program will

benefit the Museum's research efforts, as well as those of the greater research community, by providing improved access to the collections.

For FY 1989, an increase of 2 workyears and \$125,000 is requested to support various collections management efforts. They include locating, surveying, and describing the vast archival collection; acquisition of equipment and materials necessary to initiate the Museum's conservation program; purchase of equipment for participation in the Institution-wide automated Collection Information System (CIS); and converting the film collection to a long shelf-life format.

The Museum's document collections (which occupy approximately 9,000 cubic feet of storage space) must first be surveyed and described. Finding aids and indexes must be prepared, and an on-line data base system developed. This work will require an additional museum technician (1 workyear and \$29,000) beginning in FY 1989. The implementation of the Institution-wide automated Collection Information System will require additional funding of \$15,000 to allow the Museum to purchase computer equipment compatible with the Institution's mainframe computer. It is essential that Museum curators and researchers be able to access the information in this centralized data base through on-line communications with the mainframe. Museum staff members currently serving on the committees developing CIS policies and procedures for implementing the new system have stressed the need for the Museum to acquire compatible equipment to effectively utilize this important collections management tool.

As part of the Museum's effort to conserve its collections properly, a conservator will be hired from base resources in FY 1988. However, the pace of the Museum's successful program to preserve its collections of photographs, drawings and documents by converting them to machine-readable formats is increasing. Emphasis must be given to those collections approaching advanced stages of deterioration. An additional museum technician (1 workyear and \$19,000) is requested to support this project. To implement this conservation program, additional funding also is requested to purchase specialized conservation equipment (\$30,000) and conservation supplies and materials (\$12,000).

The majority of the Museum's historical film collection is stored on metal reels in metal cans, which cause rapid deterioration. The request for \$20,000 in FY 1989 will be used to save a significant percentage of these irreplaceable and historically valuable films by transferring them to plastic reels and cans. This funding also will allow the Museum to make duplicate copies of selected portions of the aviation newsreel footage produced by the Movietone News Company (the footage is currently owned by the University of South Carolina), as needed for NASM's research and other programs. Through an agreement with the University, NASM can acquire, for its collections, a master negative and positive film copy of the original nitrate film footage in exchange for transferring it to safety film.

In FY 1990 and following years, it is anticipated that funding will be requested for an additional museum technician position and computer equipment to upgrade and improve the artifact loan program and artifact record keeping system and to convert the Museum's film collection to plastic reels and cans. Additional funding to convert the Museum's film collection and the aviation newsreel footage to safety film also is being sought from outside funding sources.

Without these additional resources, artifacts, documents and films will continue

to deteriorate. The Museum's vast archival collections will remain largely unavailable to researchers for many years.

Columbus Quincentenary Program (\$11,000) - For FY 1989, a total of 1 workyear and \$41,000 (an increase of \$11,000 over the FY 1988 base level of 1 workyear and \$30,000) is requested to continue the development of a World Atlas composed of satellite images in commemoration of the Columbus Quincentenary. Publication of such an atlas will enhance the public understanding of satellite remote sensing, increase and diffuse the advances in geographical and physical knowledge of the Earth gained through manned and unmanned space missions, and provide a major reference work on world physiography and natural features. The production of this atlas as a Quincentenary program underscores the importance the science of cartography played during the Age of Exploration and the way that current advances in state-of-the-art technology continue the search to expand knowledge of the geographic world. This project will facilitate the strengthening of the Museum's ties with other academic enterprises around the world in the field of remote sensing while also producing an appropriate permanent commemorative document for this important international historical anniversary. The Atlas would be a major contribution to the proposed International Space Year (1992).

With funding provided in FY 1987 and FY 1988, the Museum began the background research and planning to produce the Atlas using remote sensing information from Landsat, SPOT (the French SPOT remote sensing satellite), and other imaging satellites. The atlas will provide an unparalleled reference for research by providing the synoptic view of geographic and environmental features that only satellite images can provide. In addition to the primary atlas, a second volume is planned that would consist of a user's guide and information about the various types of remote sensing information available, as well as a description of the sensor characteristics (multispectral, radar, film, camera systems, etc.). At present, this information is scattered throughout the scientific literature, with no single source or coherent explanation that is widely available to the public.

During FY 1988, the Museum plans to hire a project coordinator to continue background research and provide liaison with other agencies involved in satellite remote-sensing research, including NASA, the National Oceanic and Atmospheric Administration, the European Space Agency, EOSAT Corporation and SPOT Image Corporation, as well as both satellite remote groups and other international organizations. The requested increase for FY 1989 will be needed for additional support costs as the work progresses, including travel, supplies, duplication of images, and enhancement of computer equipment.

Without these additional funds, the Atlas would be limited to only selected areas and its use as a research and educational tool would be greatly diminished.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from a variety of sources including the Museum's share of the net proceeds from the museum shops and restaurant, the net proceeds resulting from bureau activities (such as the Theater and Planetarium) and small allotments. In addition to meeting expenses of the Theater and Planetarium, these funds are used to finance fellowships, research chairs, guest lecturers, symposia and special events. A portion of the proceeds from the Theater and Planetarium provide particular support for the production of new IMAX films including "The Dream Is Alive" and "On the Wing," as well as other Institution programs. Supplemental outside funding was received for both new films. In the

Albert Einstein Planetarium, the Museum premiered a new show in FY 1987, "State of the Universe." Continuing support is also provided for distinguished scholars to study at the Museum through the Lindbergh Chair of Aerospace History, The Chair in Space History and the International Fellowship. Other fellowship programs include Guggenheim and Verville, which support pre- or postdoctoral students and other distinguished scholars in aviation and space science.

Restricted Funds - Funds provided here are in the form of restricted endowments which specify the use of donations or bequests, and of gifts and foundation grants by individuals, organizations or corporations for specific purposes. Examples of these funds are the Ramsey Endowment, which finances research relating to naval flight history; the Guggenheim Endowment, which is used for lectures and stipends; the Martin Marietta Chair in Space History which supports research by distinguished scholars in the space sciences and the NASM Educational Fund. The Sloan Foundation provided grants in FY 1986 to support a four-year video history program, as well as to support a workshop, videodisc and curriculum package on aviation history. Numerous corporate donations, both monetary and "in kind," to support the gallery "Beyond the Limits: Flight Enters the Computer Age" were received in FY 1987 and have been pledged for FY 1988 and beyond. Seed money for the newly-established Glennan-Webb-Seamans Fund for Research in Space History was received in FY 1987 and FY 1988 from corporate sources.

Government Grants and Contracts - These are provided by various agencies and departments for special projects which can be conducted at NASM because of its expertise in a given area. Continued funding from the National Aeronautics and Space Administration grant program supports the following research activity in planetary geology by the Museum's Center for Earth and Planetary Studies: photogeologic investigation of planetary tectonic features, the structural geology of the Basalt Plains and the Planetary Image Facility. The research project on satellite remote sensing of central Mali, which was begun in FY 1984, continues to determine the long-term effects of climate change on the fragile environment of the inland Niger delta region. This research was expanded in FY 1985 to cover fringe areas of the world's deserts and will receive continued financial support. The Space Telescope Historical Project, a joint effort between The Johns Hopkins University and NASM, also is partially funded by NASA and will complete its planned publication in FY 1988.

NATIONAL MUSEUM OF AMERICAN HISTORY

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	318	13,363	2	185	3	1,049	10	1,265	3	67
FY 1988 -Estimate	326	13,500	2	198	3	568	6	3,816	-	5
-Base	326	13,676								
FY 1989 Estimate	336	14,462	3	201	3	618	5	2,418	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	326	10	336
11 Personnel Compensation.....	9,803	288	10,091
12 Personnel Benefits.....	1,447	110	1,557
21 Travel.....	71	-	71
22 Transportation of Things.....	24	-	24
23 Rent, Communications & Utilities.....	50	-	50
24 Printing & Reproduction.....	19	-	19
25 Other Services.....	1,397	311	1,708
26 Supplies & Materials.....	572	37	609
31 Equipment.....	213	40	253
Collections Acquisition.....	80	-	80
Total	<u>13,676</u>	<u>786</u>	<u>14,462</u>

Analysis of Increase

Necessary Pay.....	242
Program Funds.....	544

ABSTRACT - The National Museum of American History (NMAH) collects and preserves the Nation's material culture, the artifacts that embody the national heritage of the United States. By carefully enlarging and preserving its collections and using them as a basis for exhibitions, educational programs, research, and publications, the Museum offers scholars and the public the opportunity to study the history of the

United States from a unique perspective. In addition to the Mall building, the Museum maintains the exhibition "1876 Centennial," located in the Arts and Industries Building, and supervises the movement and care of objects stored in six buildings in Suitland, Maryland. For FY 1989, an increase of 6 workyears and \$544,000 is requested to support the Museum's long-range Exhibition Reinstallation Program and provide for Master Plan related electrical work (\$200,000); to prepare and convert collections management data for migration to the Institution's new Collections Information System (CIS), (3 workyears and \$215,000); to support the Museum's plans to commemorate the Columbus Quincentenary (1 workyear and \$45,000); to fund additional conservation support of collections and exhibitions (1 workyear and \$60,000); to provide administrative and research support to the Museum's American Indian Program (1 workyear and \$24,000). Necessary pay of \$169,000 is required for existing staff, along with 3.5 workyears and \$73,000 required to annualize the partial-year funding of 14 new positions approved in the FY 1988 budget.

PROGRAM - The National Museum of American History possesses the largest and most diverse collection documenting the political, cultural, scientific, industrial, and military development of the United States. Covering a wide spectrum of materials, sizes, and descriptions, these museum objects include railroad trains, automobiles, textiles, photographs, paintings, sculpture, paper materials, clothing and costumes, tools, power machinery, clocks, weapons, ceramics and glass, musical instruments, scientific instruments of all kinds, one million numismatic specimens, and 14 million stamps. The Museum preserves and protects this irreplaceable "history book of objects" through a strong ongoing collections management program that includes proper storage, conservation, registration, and archival functions.

The Museum is now engaged in a dynamic long-range Exhibition Reinstallation Program, which will reshape the way in which these collections are interpreted and presented in NMAH's exhibition halls. Through exhibitions, research publications, and an array of lectures, symposia, concerts, tours and demonstrations, and film and broadcast features, NMAH presents the unique cultural and scientific heritage of the United States to more than five million visitors per year.

Exhibitions - For several years the Museum of American History has been pursuing the integration of two major programs: the renovation of its physical plant, and the reinterpretation and reinstallation of the collections of the Museum in new exhibition halls. These two programs, otherwise known as the building retrofit and the Major Reinstallation Program, are joined in the "Master Coordination Plan."

The Major Reinstallation Program began six years ago. Thorough planning, research, and reorganization of staff, the first three major permanent exhibitions under this program have been completed. "After the Revolution: Everyday Life in America 18th Century" opened in November of 1985, followed a year later by the exhibition, "Engines of Change: Industrial Revolution in America 1790-1860." In October 1987, the third permanent reinstallation opened, titled "A More Perfect Union." This exhibit commemorates the Bicentennial of the Constitution by examining the experiences of Japanese Americans during World War II. "Field to Factory," a temporary major exhibition, opened in February 1987. This exhibit, about black migration from the rural South to northern cities between 1915-1940, has met with such success that it is now scheduled to remain on view through 1989.

Significant changes also took place on the Museum's two most popular attractions: the First Ladies Hall and the Pendulum. In the summer of 1987, the Pendulum was removed to allow for demolition and construction work in preparation for the opening

of "A Material World" in the spring of 1988. The Pendulum will remain off view for six months and be reinstalled on the second floor. The "First Ladies Hall" closed in September 1987 and will reopen in a new space on the second floor in 1991. In the interim, a small exhibition has opened which displays the gowns of living First Ladies, and a few decorative accessories.

Other major exhibitions planned for the future are: "Presidents," an exhibition about the history of the presidency and its constantly changing nature (September 1988); "Ceremonial Court," a turn-of-the-century recreation of the White House's East Wing (December 1988); "Men and Women: Dressing the Part," an exhibition using costumes to explore the issue of gender roles (1989); "Parlor to Politics," which will illustrate women's contributions to American social and political movements (1990); the "19th Century Life in America" exhibit (1990); an exhibition on the history of electronic information technologies, titled "Emergence of the Information Age," (1990); "Music in America," opening in 1991; the Quincentennial exhibition tentatively titled "America's Beginnings" (1992); and, "Science in America" (1993), exploring the relationship between the development of scientific ideas and the general evolution of American culture from the 18th Century to the present.

Space Planning - In addition to the Master Coordination Plan described above, the Museum has developed and presented to the Smithsonian a Master Space Plan. This is a long-range planning document in which the Museum's space needs over the next 30 years have been studied and projected, especially in relation to collections growth. Shortages of storage space, caused by current renovation work to the Museum and the Major Reinstallation work, are already critical and are being temporarily addressed by utilizing leased space. The need for storage space will escalate in future years. A report on the condition of the Suitland facility indicates that those buildings will no longer be usable in 10-15 years, even with maintenance.

Collections Management - In FY 1987, the Museum continued its active loan program, borrowing approximately 2,500 and lending 2,500 objects from the collections. The Museum continued to make progress on the maintenance of automated and manual documentation of its collections of over 2 million objects and 14 million numismatic and philatelic items. The Museum's accession backlog has been reduced by half in the last two years. A collections management action plan has been developed to deal with recognized problems in accountability. This work will prove invaluable to the Museum's efforts to respond to over 100,000 requests made by the public annually for information about the collections and will improve management control over the Museum's holdings, which increased by more than 165,000 objects in FY 1987. The Museum has incorporated the inventory function into a more comprehensive collections information system, which includes object accessioning, cataloguing, loan processing, and tracking movement of collections and deaccessioning.

Conservation - In FY 1987, the NMAH continued its major program to survey the condition of its collections and to accelerate the immense task of treating the backlog of objects now known to be deteriorating or imperiled by outdated and environmentally unsafe storage and exhibit conditions. Over 20 percent of the two million objects in the collections are now estimated to be in serious need of stabilization or rehousing. Over 7,200 of these objects were treated or rehoused in 1987, and over 1,500 objects were surveyed or treated in support of current exhibitions and loans, with textiles and costumes receiving special attention. A Disaster Plan for the protection of collections was completed, which involved forming

emergency teams and placing disaster supply carts at appropriate locations in the Museum.

Suitland Facility - In FY 1987, the Museum continued the asbestos cleanup program begun in FY 1985, to make the more than one million objects from the Museum's collections stored at the Institution's Suitland facility accessible and to reduce the potential health hazard to staff working with those collections. In FY 1986, Building 18 was cleaned and in FY 1987 Building 15 was finished, representing approximately 50 percent of the project. After the completion of the renovation in Building 19 in the spring of 1988, work will begin to clean and remove collections from Building 17, the largest and most contaminated building. Budget cuts in FY 1986 put the asbestos program behind schedule, and it will take several more years to complete. Collections at Silver Hill continue to be used for exhibition, research and loans. In FY 1987 the popular vehicle collections were made available for limited tours.

Museum Support Center - In FY 1986, the Museum began formal planning for the move of collections from several of its curatorial divisions to the Museum Support Center (MSC). Two members of the Museum's staff were assigned to act as project manager and part-time coordinator, respectively, and a planning committee was formed to establish a working relationship with the Museum of Natural History's move staff. In FY 1987 the Museum began packing selected collections for the move.

Collections Acquisition - In FY 1987, the Museum received numerous significant objects through purchases and gifts. These acquisitions include: a rare wooden printing press of the type used in 18th-century America; sound and rhythm synthesizers with an electronic keyboard and a speaker-amplified unit that illustrate what a composer-performer of the late 1960s would have had in a studio; 11 unusually fine Pennsylvania-German fraktur from the 18th and 19th centuries, including birth and baptism certificates and writing specimens; uniforms, badges, handbooks, and other items related to the Girl Scouts of America from 1912-1986; artifacts and archival material owned by Alice Paul that pertain to the suffrage and Equal Rights Amendment movements; leaflets and broadsides, principally in Japanese, prepared by the United States Office of War Information and by the Japanese government for circulation behind enemy lines in 1944 and 1945; a collection of transistors and other items that represent the field of microelectronics in the period between about 1957 and 1970; a Jarvik-7 artificial heart used in surgery in 1985; the final plaster models by the artist James Earle Fraser for the obverse and reverse of the Buffalo nickel, dated 1912; and a screen wagon of the type introduced at Sherman, Texas, in 1886 for more securely transporting mail.

Public Programs - Over the years, the Museum has widened its educational outreach program through initiatives directed toward minority audiences. During FY 1987, the Department of Public Programs also developed new educational activities, performance programs, and popular publications designed to make collections more available to general audiences, and launched a new series of public programs in conjunction with the Columbus Quincentenary. The Department continued to produce programs such as the Program in Black American History, the Chamber Music Program, the Saturday Afternoon Series, the Palm Court Series, and the Bandstand Series.

Some highlights from FY 1987 include: a conference of 70 museum leaders from around the country who discussed common problems and solutions in the development and use of history collections, and produced recommendations being implemented through the American Association for State and Local History; a two-day public conference, Race and Revolution: African-Americans 1770-1830, at which scholarly presenters elucidated

some of the topics presented in the exhibit "After the Revolution"; a new series of free public programs, American Sampler, that explores the 18th- and 19th-century musical heritage of blacks, Native Americans, and working class Americans; a pilot series of public programs on the role of Hispanic culture in shaping the American experience which, if successful, will become part of the Columbus Quincentenary Program; and new visitor activity centers, in the Museum's "Engines of Change" and "A More Perfect Union" exhibits, developed by the Division of Education and based on the Museum's experience with the "Hands on History" room.

Research - The Division of Transportation continues its basic survey of the U.S.S. Indiana artifacts, including the earliest propeller-driven ship's machinery ever recovered, while the artifact collections of the Department of the History of Science and Technology continue to support a wide variety of research projects. A sampling of recent collections-related research includes the use of technology collections to document patterns of economic, social and technical change such as: the contribution of American clock makers (particularly the Bond family) to the field of astronomy; everyday life of the American soldier, as well as a study of the role of nurses in hospitals; and ways in which computers are changing social structures (in conjunction with the major exhibit, "Information Age").

Research resulted in important publications in FY 1987, including Pete Daniel's award-winning book on agriculture in the New Deal Era, Breaking the Land; Robert Post's book, Streetcars for the Angels: Electric Street Railways in Los Angeles; Spencer Crew's, Field To Factory: Afro-American Migration 1915-1940, Engines of Change, The American Industrial Revolution 1790-1860, by Brooke Hindle and Steven Lubar; and Official Images, New Deal Photography by Pete Daniel, et al.

The National Museum of American History has opened an Office of Academic Programs. This Office is responsible for coordinating the Museum's many relationships with colleges and universities and for overseeing the Museum's fellowship programs. In January 1988, it became the editorial home of the American Quarterly, the journal of the American Studies Association. In addition, the Museum's commitment to the journal, Technology and Culture, has been renewed for five more years. This Office was opened to strengthen joint programs and ties with other academic enterprises in areas of common interest.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 6 workyears and \$544,000 is requested to support the Museum's long-range Exhibition Reinstallation Program and provide for Master Plan related electrical work (\$200,000); to prepare and convert collections management data for migration to the Institution's new Collections Information System (CIS), (3 workyears and \$215,000); to support the Museum's plans to commemorate the Columbus Quincentenary (1 workyear and \$45,000); to fund additional conservation support of collections and exhibitions (1 workyear and \$60,000); and to provide administrative and research support for the Museum's American Indian Program (1 workyear and \$24,000).

Major Exhibit Reinstallation/Master Space Plan (\$200,000) - The Museum is committed to the revitalization of the physical plant of the Museum in conjunction with the Major Exhibit Reinstallation of its exhibitions. To accomplish the goals successfully, the Museum is seeking Federal and private support for this program at an anticipated annual cost of \$2,700,000. An amount of \$1,000,000 is needed from Federal appropriations (currently the Museum's Federal base is \$727,000), with the remaining funds anticipated from private sources (corporate sponsors). Without this level of Federal support, the Museum cannot hope to remain on schedule with the planned

upcoming permanent exhibit reinstallations. Private funding cannot always be found to support certain types of exhibits. A secure Salaries and Expenses base of \$1,000,000 will guarantee that the master reinstallation plan can go forward as scheduled. Additional support is anticipated from the Repair and Restoration of Buildings appropriation for the Master Space Plan.

For FY 1989 the increase of \$200,000 is requested for the Major Exhibit Reinstallation program to modify existing electrical systems (\$100,000) and to incorporate state-of-the-art computer technology into interactive exhibition formats (\$100,000).

In conjunction with the Master Space Plan work, the Museum has had difficulty finding available funding for electrical work. The Museum of American History is now 20 years old. As part of the revitalization Master Space Plan, many safety and electrical systems are being changed; however, the basic trunk line system/electrical distribution network does not accommodate current exhibit technology. An amount of \$100,000 will enable the Museum to modify the existing system so that it meets the requirements of new types of lighting units, audio visual units and interactive video disk systems now being used in exhibit design and construction. Additionally, it is important to do the electrical work at the same time, as demolition in scheduled areas of the building will lay bare the old electrical system. Postponement would require duplication of effort and additional costs.

The remaining \$100,000 will allow the Museum to integrate the use of computers, video disc systems, and other computer components such as microchips in the reinstallation of the Museum's major exhibitions. This increase will allow incorporation of the use of computers in exhibit design and production. This new technology allows history exhibits to interconnect different exhibition themes and present new interactive formats to the public. The increase would be used specifically for the purchase of hardware and software systems.

Collections Information System (3 workyears and \$215,000) - For FY 1989, an increase of 3 workyears and \$215,000 is requested for the conversion of the Museum's automated collections data file of 1.3 million records from the outmoded Honeywell/SELGEM system to the Smithsonian's new Collections Information System (CIS). The Museum took the first steps toward automating its collections data in the early 1970s. The inventory project of 1978-1983 provided the opportunity for accelerating the development of a standardized, Museum-wide data base.

The Smithsonian recognizes management, care and security of its collections as basic Institutional commitments. Development of a Collections Information System (CIS) is a Smithsonian-wide priority. CIS at the Museum of American History will permit reliable, on-line, access to the Museum's data and will allow the Museum to better manage that data for collections development and management, research, exhibitions, public service, and security. The application of CIS at the Museum also will allow sharing of data with other participating Smithsonian bureaus, which dramatically enhances the research use of the collections. The Smithsonian's current emphasis on research calls for flexibility on the part of bureaus in both the development of and the response to new initiatives in the history, art, and science disciplines. CIS is an essential element of that flexibility.

Currently, the Museum does not have the staff positions to provide the necessary technical assistance to accomplish the conversion. If support is not provided for computer usage costs, a continuing burden will be placed on funds, which have declined

since FY 1985; backlogs will grow in processing new accessions, loans, and location changes; and information required to verify the inventory data will be unavailable. In FY 1987, there were 700,000 objects in the record keeping backlog. While conversion will occur eventually, the process will be protracted, and data collected during the inventory project will no longer be useful. The Museum will lose accountability for a large portion of its collections.

The requested increase of 3 workyears and \$73,000 will allow the Museum to hire an analyst/programmer and two museum registration technicians. The analyst/programmer will work with Museum staff and the Smithsonian's Office of Information Resource Management (OIRM) staff on the MAH/CIS design, and the registration technicians will assist in a final review and edit data categories. The Museum's computer usage costs for the Collections Information System are projected at \$100,000, which includes programming and technical assistance provided by OIRM. Training of technical and curatorial staff participating in the conversion process (\$40,000) and funds for supplies (\$2,000) will also be required for FY 1989. Funding is required over a five-year period from FY 1989 to FY 1993. The Museum expects training costs to decrease after FY 1989 to approximately \$5,000 per year; however, computer usage costs are expected to increase.

Columbus Quincentenary Program (1 workyear and \$45,000) - With funding requested for FY 1987, the Museum of American History contemplates a 5-year series of planning conferences, small exhibits, and public programs leading to the opening of the Museum's permanent, 8,000 square foot Quincentenary exhibit for FY 1992, tentatively titled "America's Beginnings." The exhibit will compare Spanish, French, English, and Dutch settlement patterns in North America in the 17th century, emphasizing the difference in the way Native Americans and colonists viewed the environment and their interrelationships with each other.

In September 1987, a two-day meeting of archaeologists and ethnohistorians was held to begin planning for "America's Beginnings." It was accompanied by a one-day public forum on the archeology of 17th-century colonial sites in North America and the opening of a six-month exhibit on Drakes Bay, a 16th-century European contact site in California.

In FY 1988, a full-time program manager was hired to coordinate the work of the exhibit team and to organize the conferences, the small exhibits, and the public programs. A second planning conference, on American Indian perceptions of European colonists, will be held in March 1988, along with a second public forum and the opening of a small exhibit on 17th-century English settlement sites. The exhibit team will survey the existing collections of artifacts relating to Spanish, French, Dutch, and English settlements in American and European museums, and will identify specific artifacts for exhibit in 1992. Team members will pursue areas of original research identified at the September 1987 planning conference, and a contract will be let to plan an introductory film for the exhibit based on the results of the March 1988 planning conference.

During FY 1989, a series of monthly public programs on the origins of Hispanic culture in the United States will be added to the program. These programs, derived from a series of pilot programs to be conducted in FY 1988, will make scholarly research on the evolution of Hispanic culture in this country available to a popular audience in a variety of formats, including video and television spots. To produce these programs, a full-time coordinator is needed through 1992 (1 workyear and \$24,000) and support funds for contractual services, supplies and materials (\$21,000).

Conservation (1 workyear and \$60,000) - For FY 1989, an increase of 1 workyear and \$60,000 is requested for an objects conservator (1 workyear and \$35,000) and supplies (\$25,000) are necessary to reduce a very large conservation backlog. Collections in need of conservation treatment and improved storage conditions will receive special attention.

The conservation needs of artifacts in reference collections on the Mall and at Silver Hill are well documented, since detailed conservation condition surveys were begun in 1978. Every year since then, one or more collections have been selected by conservators for an object-by-object examination. Depending upon the type of collection surveyed, between 15 to 30 percent of the objects have been found in serious need of treatment or rehousing. Hundreds of thousands of objects are known to be gradually deteriorating and will ultimately become useless for research or exhibition. Currently, about 50 percent of staff time and supplies are devoted to efforts to reduce the backlog. In addition, all new decisions made by the collection committee require the consideration of conservation needs before approval is given to acquire an object. Despite these efforts, the backlog has continued to increase and to preserve these artifacts, a long-range phased effort, with the addition of staff and supplies to the Museum's present base resources, will be required.

The requested increase will provide a conservator who will coordinate the overall project with collections managers, perform some of the more specialized treatments, and recruit and supervise technicians, interns and volunteers capable of carrying out many of the time-consuming but relatively routine procedures. The backlog reduction project is expected to continue indefinitely, and the requested increase of 1 workyear and \$60,000 will continue to be dedicated to this project.

American Indian Program (1 workyear and \$24,000) - In 1986, this program was begun to promote increased public awareness and understanding of other cultures with the hiring of a program director. In FY 1987, the program director raised funds from Smithsonian and outside sources in excess of \$25,000 to support the production of several educational printed, visual, and audio resources in American Indian history. In addition, the Program hosted six American Indian students through its internship program, produced six public programs on aspects of Indian history and culture, and established cooperative relationships for project outreach with over 20 Indian communities and tribes. Two books on American Indian history are in manuscript form. Additionally, the Museum coordinates efforts with the American Indian Program in the Museum of Natural History.

Planned for FY 1988 and FY 1989 are one traveling exhibit, parts of two new permanent exhibits, assistance for the production of two six-part television series on Indian history, a new performance and film series on Indian culture, and various educational materials aimed at Indian and non-Indian audiences.

Without an additional staff member working full-time to support program activities, the Museum cannot hope to respond to the increased number of requests for assistance from tribes and educators. The requested staff member would enable the Museum to build a solid underpinning for the program, independent of part-time, temporary assistance from interns. The failure to stabilize and support the program through additional staff will weaken this new program, which was designed to open the resources of the Smithsonian to American Indians and to the general public. Since the program's inception, public inquiries have gone from an average of 2 per month to 30-40 per week. Education projects (publications, media products, etc.), have gone from

zero to five or more per year, and public programs and presentations from none to over 30 per year. One workyear and \$24,000 will fund the needed program assistant position.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - This income is provided from various sources including the Museums's share of museum shop and cafeteria sales, publication royalties and various annual allotments. In FY 1988, these funds will be used to support the salary and benefit costs for the positions of museum director and a graphic designer, as well as cultural history collections acquisition, an Afro-American Communities project, and the Museum's unique Chamber Music performance and recordings program.

In addition, funds from the Institution's Collections Acquisition, Scholarly Studies and Educational Outreach Program, Research Opportunities fund, Smithsonian Society, and the Special Exhibition Fund support research, education and exhibition projects. In FY 1987, the total funding from these programs amounted to \$519,000, providing various levels of support for many projects. Expenditures under these programs have not been recorded for FY 1988 and FY 1989 which explains the variance in totals shown between FY 1987 and the subsequent two years.

Restricted Funds - The principal sources of income for these funds are individual or corporate gifts and foundation grants which are provided for specific purposes. In FY 1987, the following gifts and grants were received: a gift from E. I. du Pont de Nemours and Co., Inc., to support the exhibition, "A Material World"; a grant from the Japan Shipbuilding Industry Foundation to develop the Museum's bicentennial of the Constitution exhibition, "A More Perfect Union," which will highlight the Japanese-American experience; also a grant from ChemicalBank to support the same exhibit, "A More Perfect Union"; a gift from D.C. Comics to support an exhibit celebrating the 50th anniversary of Superman and a scholarly symposium on the "Modern Day Hero"; a gift from the Noble Foundation for the general support of the Music Program at the Museum of American History; a gift from Miles Laboratories, Inc., to continue the support of an Alka Seltzer oral history program; a gift from Dr. Jesse T. Littleton for the development of a fundraising campaign to sponsor the, "Health in America," exhibit; another gift for the exhibition, "Health in America," from the Sandoz Pharmaceutical Corporation; and the first installment of a five-year grant from Sears Roebuck Inc., to support the recreation of part of the White House in the new exhibit titled, "Ceremonial Court."

In support of the Museum's ambitious new permanent exhibit on the "Information Age," installments on major grants were received from the following corporations: IBM, Xerox, and Texas Instruments.

Government Grants and Contracts - The Museum received a grant from the D.C. Commission on the Arts and Humanities to support the salary and benefits of a public affairs specialist.

NATIONAL MUSEUM OF AMERICAN ART

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	115	5,105	-	39	4	2,746	-	630	-	1
FY 1988 -Estimate	118	5,036	-	114	4	246	-	314	-	-
-Base	118	5,093								
FY 1989 Estimate	119	5,297	-	59	4	241	-	290	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	118	1	119
11 Personnel Compensation.....	3,192	70	3,262
12 Personnel Benefits.....	462	21	483
21 Travel.....	51	14	65
22 Transportation of Things.....	60	-	60
23 Rent, Communications & Utilities.....	40	-	40
24 Printing & Reproduction.....	120	-	120
25 Other Services.....	393	67	460
26 Supplies & Materials.....	283	18	301
31 Equipment.....	142	14	156
Collections Acquisition.....	350	-	350
Total	<u>5,093</u>	<u>204</u>	<u>5,297</u>

Analysis of Increase

Necessary Pay.....	56
Program Funds.....	148

ABSTRACT - The National Museum of American Art (NMAA) is devoted to the acquisition, preservation, study, and exhibition of American painting, sculpture, graphic arts, and crafts. The Renwick Gallery, which operates under the purview of the National Museum of American Art, exhibits American crafts as well as decorative arts and design objects. The Barney Studio House is also maintained by the Museum as a period home open for tours and for special interpretive programs. For FY 1989, an

increase of 1 workyear and \$148,000 is requested for collections management (1 workyear and \$70,000); to initiate research and planning for an exhibition commemorating the Columbus Quincentenary (\$25,000); and to continue the development of the Inventory of American Sculpture (\$53,000). Necessary pay of \$56,000 is required for existing staff.

PROGRAM - The National Museum of American Art's collection represents American art from its beginnings to the present and serves as the basis for active programs of research, exhibition, and public education. The permanent collection includes approximately 34,000 objects and continues to grow at a rate of approximately 1,000 new acquisitions each year. A portion of the permanent collection is on view to the public on a rotating basis in the Museum's galleries. The balance is available in storage for study or loan to selected museums and university galleries throughout the country. Preservation and restoration of irreplaceable American art works are also important to the Museum's mission. Scholarly research performed by the professional staff results in publications, exhibitions, and educational programs which further the understanding of American art and artists.

The Museum's reference materials are used by both lay and scholarly researchers from a wide variety of disciplines. Unique among the Museum's research resources are the Inventory of American Paintings Executed Before 1914; the Smithsonian Art Index, which lists art works housed in the Institution's non-art museums; and the Index of American Art Exhibition Catalogues, which documents artistic activities in this country and Canada. These inventories comprise more than 500,000 computer entries and constitute the most complete data base on the subject of American art in existence.

Collections - In FY 1987, the Museum received as a gift from Patricia and Phillip Frost a major collection of 114 paintings, sculptures, and graphic works created by members of the American Abstract Artists group of the 1930s and 1940s. This collection will complement the Museum's already strong holdings of realist paintings from this same period. The Museum and the National Portrait Gallery also received as gifts a portfolio of photographs by and from Irving Penn.

Other gifts to the Museum included paintings by Will Barnet, Robert Birmelin, Sanford Gifford, and John Valentine Haidt; sculpture by Leo Amino and Scott Burton; graphic works by Philip Guston and Herman Maril; photographs by William Christenberry, William Eggleston, and Reginald Marsh; and decorative arts by Rudy Autio, Cornelia Breitenbach, and William Harper.

Acquired as a partial purchase and partial gift, the Herbert Waide Hemphill Collection of American Folk Art marks a significant new direction in the Museum's collecting activities. The acquisition of the 378 works in this collection, which was generally acknowledged as the finest still in private hands, has generated intense interest from around the country and makes the NMAA one of the Nation's most important centers for the study and display of American folk art.

The Museum also purchased a major canvas by the 19th-century painter Eastman Johnson entitled "The Girl I Left Behind Me." Other purchases included an important early painting by Lee Krasner; sculpture by Harriet Hosmer and Joel Tanner Hart; graphic works by Peter Blume, Dorothy Dehner, and Rose O'Neill; photographs by Dick Arentz, Lisette Model, and Sonya Noskowiak; and decorative arts by John Roloff.

In FY 1987, the Museum embarked upon an expansion of its collecting and programmatic activities at the Renwick Gallery, which features American craft and

decorative arts. New initiatives include addition of a fellowship for graduate or post-graduate students of craft (sponsored by the James Renwick Alliance and the American Craft Council), enlarged exhibition and acquisition programs, and appropriate additions to the staff.

The ongoing projects to ensure the safe and efficient storage and handling of art work throughout the Museum were augmented by significant procedural revisions and reorganization of collections management staff. The conservation staff completed significant work on almost 400 paintings, sculptures, works on paper, and decorative arts.

Publications - FY 1987 marked the inaugural appearance of Smithsonian Studies in American Art. Copublished with Oxford University Press, the biannual journal features scholarly articles offering new interpretations and research in the field. Circulation is already at 1,500 copies, and the frequency of publication will increase to three issues in 1988 and probably four in 1989.

Exhibition catalogues were produced for Gene Davis, A Memorial Exhibition and Modern American Realism: The Sara Roby Foundation Collection. The manuscript for an anthology of critical writings on Man Ray was edited and sent to Abbeville Press for publication in 1988.

The Museum published its six-volume Index to American Art Exhibition Catalogues, From the Beginning through the 1876 Centennial Year that lists art works in all catalogues of art exhibitions held in the United States and Canada from earliest colonial times through the Centennial Exposition of 1876. Other publications in progress include a book on the sculpture of Paul Manship, a biography of Alice Pike Barney, a catalogue on the drawings of Joseph Stella, and a comprehensive study on Albert Pinkham Ryder.

Several publications were singled out for recognition in graphic design competitions: the invitations for the Ray Metzker and James Rosenquist exhibitions received Awards of Merit from the American Association of Museums; Treasures from the National Museum of American Art and the Patrick Ireland catalogues received Awards of Excellence from the Art Museum Association of America; and awards and honorable mentions were received from the Washington Book Publishers Association for the Figure Prints checklist, the cover of the Patrick Ireland catalogue, the Rosenquist invitation, and the Women Artists and Research Resources brochures.

Research - This past year saw the successful completion of the Inventory of American Sculpture pilot project undertaken to automate the University of Delaware's index of American sculpture files. Over 6,000 sculpture records were entered in the last 12 months, bringing the total to just over 20,000. These records will provide a firm foundation upon which to launch a systematic nationwide survey of sculpture. A computer format utilizing United States Machine Readable Cataloguing (USMARC) fields and subfields, capable of addressing the unique complexities of American sculpture, has now been fully developed and tested. A sculpture report form has been designed and extensive preparations have been made for a massive mailing planned to announce the national solicitation of new entries.

In addition, the Inventory of American Paintings project, upon which the sculpture inventory was modelled, also experienced significant growth. Nearly 4,000 new entries were added to the data base, bringing the total number of records to 250,000. Research inquiries were up nearly ten percent from last year--to a total of

1,800 requests. Over 2,100 nitrate negatives from the Museum's Peter A. Juley and Son Collection were converted to stable film. Approximately 800 slides and 9,500 prints were added to the Slide and Photograph Archives. Research requests to the Archives increased an estimated 20 percent over last year. Significant progress was also made in the Artist Authority Project, a relational data base linking the Museum's seven art research data projects. From NMAA's permanent collection, 1,600 names have been researched, and a mailing effort to request further biographical information has been implemented.

Exhibitions - During FY 1987, significant works from the Museum's collections, specific artists, and thematic topics pertaining to the history of American art were exhibited. "American Art Deco," organized by NMAA's Renwick Gallery, and "John La Farge," jointly organized by NMAA and The Carnegie Museum of Art, Pittsburgh, opened in FY 1987 and will circulate to six other museums across the United States. "Treasures of the National Museum of American Art," which introduced the Museum's collections to areas of the country where it was relatively unknown, ended its five-city tour and after a brief showing at the Museum upon its return, have been reinstalled in the permanent exhibition galleries along with other new "treasures" acquired since the tour began in February 1986.

Other exhibitions organized in FY 1987 included: "Gene Davis: A Memorial Exhibition"; "Modern American Realism: The Sara Roby Foundation Collection"; and "Close Focus: Prints, Drawings, and Photographs." NMAA also presented "James Rosenquist: Paintings 1961-1985" and "American Traditions in Watercolor: The Worcester Art Museum Collection," which were organized by museums elsewhere.

At the Renwick Gallery, outside exhibitions included "Russia: The Land, The People" (organized and circulated by the Smithsonian Institution Traveling Exhibition Service [SITES]); "Quilts from the Indiana Amish"; and "Dan Dailey: Glass, 1972-1985." To reinforce its identity as the Smithsonian's showcase for 20th-century American crafts, the Renwick opened its first installation of contemporary crafts from the Museum's permanent collection in March. "Alice Pike Barney: The Paris Years" continued on view at Barney Studio House.

Among the exhibitions and installations which have opened in FY 1988 at the Renwick and NMAA are: "Lost and Found Traditions: Native American Art 1965-1985"; "The Victorian View of Children"; "Cynthia Schira: New Work"; "Supreme Instants: The Photography of Edward Weston"; and "Special Delivery: Murals for the New Deal Era."

The National Museum of American Art loaned more than 150 artworks from its permanent collection to museums and organizations across the United States and Europe. NMAA continued its policy of placing European works on long-term loan to educational institutions and small museums across the nation.

Interpretive Programs - During FY 1987, the National Museum of American Art and its Renwick Gallery presented a rich and varied program of lectures, seminars, symposia, and films interpreting and amplifying its permanent collection and temporary exhibitions. Programs included lectures by photographer Ray Metzker; artist James Rosenquist; glass artists Dan Dailey, Stephen Dale Edwards, and Richard La Londe; and fiber artist Katherine Westphal.

The Washington Post Company provided generous support for a panel discussion held in conjunction with "Gene Davis: A Memorial Exhibition," which included presentations by five prominent art world figures. Walter Hopps, Director of the Menil Collection;

artist Jacob Kainen; Jock Reynolds, Executive Director of the Washington Project for the Arts; former Davis pupil Ann Purcell; and Washington Post art critic Paul Richard analyzed the development of color painting in the 1960s and its importance to Washington artists today.

United Technologies Corporation supported an all-day program including presentations by a select group of scholars in the field of American art in conjunction with "Treasures of the National Museum of American Art." A day-long panel discussion was also held by contemporary artists whose work was featured in the exhibitions "Modern American Realism: The Sara Roby Foundation Collection" and the "Treasures" exhibition.

The Renwick Gallery hosted a symposium cosponsored by SITES and the Kennan Institute for Advanced Russian Studies held in conjunction with "Russia, The Land, The People: Russian Painting 1850-1910," as well as a symposium in conjunction with the exhibition "American Art Deco."

In FY 1988, the NMAA hosted a symposium, "The Stained Glass Tradition in America" cosponsored by The Carnegie Museum of Art, which was held on the occasion of the Museum's exhibition John La Farge. A symposium on "American Traditions in Watercolor" was held in conjunction with the Museum's forthcoming exhibition of watercolors from the Worcester Art Museum, made possible with support from the Digital Equipment Corporation.

At the Renwick Gallery Lost and Found Traditions: Native American Art, 1965-1985, made possible by the American Can Company Foundation, included a series of demonstrations of skills by various craftsmen represented in the exhibition, as well as films on Native American art.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 1 workyear and \$148,000 is requested for collections management (1 workyear and \$70,000); to initiate research and planning for an exhibition commemorating the Columbus Quincentenary (\$25,000); and to continue the development of the Inventory of American Sculpture (\$53,000).

Collections Management (1 workyear and \$70,000) - The past three years have witnessed the rapid growth of the Museum's permanent collection through the gift and purchase of several private and public collections: The Container Corporation Collection (311 objects), the Sara Roby Foundation Collection (178 objects), the Herbert Waide Hemphill Collection of American Folk Art (378 objects), and the Patricia and Phillip Frost Collection (114 objects). In addition, the Museum has accepted the transfer of approximately 1,000 works from the National Museum of Natural History/Museum of Man and sizable holdings from the National Endowment for the Arts. These major collections, over and above the Museum's usual annual purchases and individual gifts, have dramatically increased the Museum's collections management responsibilities.

The Museum's first responsibility is to ensure that these new collections are properly stored, maintained, and preserved for future generations. The works will be displayed in rotation with other holdings of the Museum; the remainder of the collections will be in storage. To accommodate these additional paintings, new storage screens must be installed in NMAA's storage areas.

Many of the new collections include sculpture and other three-dimensional objects in a variety of media; the Hemphill Collection of Folk Art, in particular, has a great number of objects in wood and other fragile materials, many of which were created by self-taught artists heedless of sound techniques and practices. The stabilization of such objects and the repair of existing deterioration will require specialized conservation skills. Since these skills are not currently represented in the NMAA conservation staff, who are specialists solely in paintings and works of art on paper, this specialized work would be done by contract.

However, the services of a fulltime permanent objects conservator are required to care for the Museum's large collection of American sculpture that is considered one of the finest in the country. The conservator would also provide care for the increasing number of objects in the craft media acquired for the Museum's Renwick Gallery during the past five years. The variety of sculpture and craft objects now in the Museum's collection require the permanent attention of a permanent staff conservator to provide long-range collections care. To ignore such major conservation needs would be a breach of the Museum's responsibility to care for the objects entrusted to it.

To provide basic care and storage for these collections, the Museum requests an increase for one permanent conservator (\$35,000), for contract services for objects requiring specialized treatments (\$25,000), and for installation of storage screens in the Museum's protected storage area (\$10,000). In FY 1990 and following years, the amounts estimated for in-house and contract conservation will remain the same; the increase requested for secure storage will be devoted in future years to up-grading other permanent collection storage.

Columbus Quincentenary (\$25,000) - As part of the Smithsonian's celebration of the Columbus Quincentenary, the National Museum of American Art will present a major exhibition, titled "The Promised Land," using paintings, sculptures, graphic arts, printed books, and collateral materials to show how the receding frontiers of the West assumed a mythic attraction for Americans between 1830-1890. The exhibition will demonstrate the dual nature of the settlement of the West--the positive aspects of exploration and development, as well as the problems and dislocations, both physical and psychic, that attended this intrusion into nature's wilderness and the encounter with its native inhabitants.

The exhibition will synthesize a generation of new research in the areas of social, cultural, and art history and will illuminate an aspect of history in which the Smithsonian collections are especially rich. Additionally, new research into the intentions and accomplishments of the explorers and early settlers will expand our understanding of this westward impulse. A book based on the new research will accompany the exhibition.

For FY 1989, a requested increase of \$25,000 will permit initial research and planning for the exhibition. Travel to study potential exhibition objects is requested (\$9,000), necessary photographic and conservation services will be initiated (\$7,000), archival reference materials will be purchased (\$3,000), and the necessary exhibition management hardware and software will be acquired (\$6,000). For FY 1990, the request will increase to \$50,000 to cover costs of research assistance during the period of greatest preparatory work.

National Inventory of American Sculpture (\$53,000) - For FY 1989, an increase of \$53,000 is requested to commence survey work on the National Sculpture Inventory Project. In response to a nationwide appeal from educators, cultural historians,

conservators, collectors, curators, and scholars, the NMAA has begun the task of documenting American sculpture in both public and private collections and in parks and town squares throughout the United States. The NMAA was asked to conduct this nationwide survey because of its commitment to research in the study of American art and its expertise in establishing a similar inventory of American paintings.

Using the successful methodology of the Inventory of American Paintings, a one-year grant from the Henry Luce Foundation provided the NMAA with \$65,000 in 1985 to successfully automate the Index of American Sculpture compiled by the Art History Department of the University of Delaware. This grant, along with some Federal funds redirected on a one-time basis within the Museum's base, provided for the pilot project which explored the feasibility of a systematic nationwide sculpture survey by permitting the testing, formatting, and entry on computer of an index compiled over a period of 20 years. The Museum is not able to redirect funds on a sustained basis. Therefore, it is vital that a Federal base be established if the next phases of the inventory are to proceed.

The data base, approximately 20,000 records resulting from the efforts of the pilot project, is the only substantial accessible reference source containing information on the artist, location, physical characteristics, and subject matter of sculpture in over 800 institutions. Thus, the NMAA has provided the technical assistance and national forum necessary to assemble and share otherwise unavailable information and to enable new research initiatives.

Since sculpture has been an area in which published material is greatly lacking, implementation of a systematic nationwide survey will be essential to the ultimate success of the project. The Museum is collaborating on a survey of outdoor sculpture with other interested agencies: the National Institute for Conservation of Cultural Property, the National Park Service, the American Association for State and Local History, and the National Council of State Historic Preservation Officers. This systematic effort to locate the bronze and marble statues in the parks and town squares across the Nation will result in the largest research data base on sculpture in the world. The nationwide survey will also serve as a critical first step toward a conservation study of America's public monuments. As a unique form of educational outreach, it will bring citizens together on community levels to seek and identify the statues and memorials in their states and home towns that honor great men and women, forgotten heroes, and historic events.

It is anticipated that a systematic nationwide survey of outdoor monuments can be completed in seven to ten years at the requested level of funding. The requested increase of \$53,000 will allow the Museum to contract for essential data entry services to place this vital survey information on computer. In addition to funding for contractual services (\$35,000) for data entry, funding will be applied to travel costs (\$5,000); equipment (\$8,000); and supplies such as film, diskettes, and computer ribbons (\$5,000).

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are derived from a variety of sources including the Museum's share of sales in the restaurant and museum shop; royalties from publications; small allotments; sales of slides and photographs; honoraria received by staff while on official duty; participation fees from museums to which National Museum of American Art exhibitions are lent; tuition reimbursement from universities for NMAA interns; and sales of deaccessioned works of art. (Income from

sales of deaccessioned works is used only for new acquisitions and in FY 1987, the National Museum of American Art acquired, through a gift and the income from sales of deaccessioned art, the Hemphill collection of 378 folk art objects from Herbert Waide Hemphill, Jr., of New York. These remarkable objects, which will be exhibited in FY 1990, will enrich the Museum's holdings in American art and prove beneficial to scholars of both art and social history.) Funds also are used to support the continuation of the Inventory of American Sculpture; publications, traveling exhibitions, and public programs; curatorial research and travel; repairs to the Barney Studio House; stipends for summer interns; special events; purchase of photographic supplies; and purchases of works of art for the collection. Through an agreement with the J. Paul Getty Center for the History of Art and the Humanities, funds have been made available to continue the preservation project of the Juley Collection until its anticipated completion in FY 1995.

Restricted Funds - These funds are contributed for specific purposes in the form of gifts and grants from individuals, foundations, or corporations. With support from the Robert Tyler Davis bequest, prints and drawings continue to be purchased for the permanent collection. Other significant uses of restricted grants and gifts include the continuation of the Inventory of American Sculpture project supported by the Henry A. Luce Foundation, the purchase of artworks, and the costs of annual meetings of the American Art Forum, which are supported by various donors. New funding was received in FY 1987 from Primerica (formerly American Can Company Foundation) and the Sacred Circles Fund for the "Lost and Found Traditions" exhibition in FY 1988; from various donors for the "American Art Deco" exhibition which was on view at the Renwick Gallery from April through June 1987 and will tour through July 1988; and from a cooperative agreement with the National Endowment for the Arts for a bibliography of resource materials on museum programs accessible to the aged or disabled. The NMAA is actively seeking private funding for the continuation of the Inventory of American Sculpture project and for a number of exhibitions and programs in FY 1988.

NATIONAL PORTRAIT GALLERY

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	84	3,879	-	18	-	116	-	208	-	22
FY 1988 -Estimate	85	4,038	-	25	-	37	-	323	-	67
-Base	85	4,082								
FY 1989 Estimate	87	4,068	-	25	-	45	-	320	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	85	2	87
11 Personnel Compensation.....	2,523	67	2,590
12 Personnel Benefits.....	314	28	342
21 Travel.....	32	-3	29
22 Transportation of Things.....	60	-10	50
23 Rent, Communications & Utilities.....	25	-	25
24 Printing & Reproduction.....	90	-20	70
25 Other Services.....	413	-66	347
26 Supplies & Materials.....	182	-5	177
31 Equipment.....	80	-5	75
Collections Acquisition.....	363	-	363
Total	4,082	-14	4,068

Analysis of Increase

Necessary Pay.....	60
Program Funds.....	-74

ABSTRACT - The National Portrait Gallery (NPG) is dedicated to the exhibition and study of portraits of people who have made significant contributions to American history, development and culture, and of the artists who created such portraiture. The FY 1989 estimate reflects a decrease of \$139,000 associated with nonrecurring expenditures in the FY 1988 base for the Bicentennial of the Constitution of the United States. An increase of 1 workyear and \$65,000 is requested to provide for a

computer systems manager (1 workyear and \$35,000), and to upgrade collections storage areas (\$30,000). Necessary pay of \$44,000 is required for existing staff, along with .75 workyear and \$16,000 required to annualize the partial-year funding of 3 new positions approved in the FY 1988 budget.

PROGRAM - The arts of portraiture and biography are the means by which the Gallery offers a continuing exploration of the heritage and accomplishments of the American people. The Gallery collects, studies, preserves, and exhibits portraits in all media as both historical and artistic documents.

The development of NPG's collections engenders substantial and ongoing research into American political, social, and intellectual history, and the history of American art. Research results are published by curators and historians in scholarly articles and monographs and are shared with the public in substantial exhibitions and their attendant catalogues. Temporary exhibitions in the Gallery frequently deal with subjects or artists never before explored, bringing together works from public and private collections to be shown with objects in the Gallery's permanent collections. The accompanying publications constitute a growing body of books of permanent research value.

The collections of the National Portrait Gallery are cared for by professional conservators on the Gallery's staff.

Collections Acquisitions - The most important painting added to the collections of the National Portrait Gallery in FY 1987 was the splendid portrait of Benjamin Franklin done in 1785 by J. S. Duplessis; this was a gift from the Morris and Gwendolyn Cafritz Foundation.

Other significant gifts to the Gallery during FY 1987 included portraits of Admiral George Dewey and Mrs. Dewey by Theobald Chartran; nine original plaster busts by Jo Davidson; paintings of David Sarnoff and William B. Astor; the early American composer George F. Bristow; and first president of Vassar College, John Howard Raymond. Additional gifts included a sculptured head of the painter Gardner Cox; John Summerfield, the early Methodist preacher, by William Jewett; and, by purchase and gift, a portrait of the author James Jones by Bernard Childs.

In FY 1987, the Gallery purchased a number of significant portraits using appropriated funds, including paintings of William Pitt Fessenden by Constantino Brumidi; Dr. Helen Lynd by Alice Neel; and Rubens Peale by his brother Rembrandt Peale. Portraits of Justice Louis Brandeis, Charles Lindbergh and Dr. Alexis Carrel by Samuel J. Woolf, along with a portrait by an anonymous artist of the first American woman sculptor, Patience Wright, also were purchased. The Presidential portrait series was enhanced by the purchase of a life portrait of President Andrew Johnson by Washington Bogart Cooper. Also acquired were three painted caricatures by Thomas Nast, including a representation of the poet, William Cullen Bryant.

The Print Department received a major gift in 1987 of 107 life drawings of famous Americans (about 40 percent of whom had not been previously represented in the permanent collection) by the renowned portrait illustrator Samuel J. Woolf. In addition, a very fine etching of Consuelo Vanderbilt by Paul Helleu was acquired as a donative sale, and Mrs. Alfred Bendiner donated to the library over 300 books covering the history of caricature.

Print purchases included a color woodcut of Jed Harris by William Auerbach-Levy and a set of the five "American Kings" (first five presidents) published by Pendleton after Gilbert Stuart. Drawings purchased in FY 1987 include an important watercolor of President Ulysses S. Grant by Thomas Nast, a watercolor of Edwin Austin Abbey by "Spy" (Sir Leslie Ward), and several crayon portraits by Hugo Gellert. In the area of caricature, the Print Department acquired the remainder of a group of drawings by Henry Major; four early works by Al Hirschfeld; a drawing of John Dos Passos by Adolf Dehn; and three drawings by William Sharp. Posters representing Buster Keaton, Rita Hayworth, and Rudolph Valentino made in France, Italy, and Belgium, as well as an American six-sheet poster of James Cagney and an exceptional image of Buffalo Bill were also purchased.

The major purchases for the Department of Photographs included vintage photographs of Gertrude Stein by Man Ray, Dwight David Eisenhower by Richard Avedon, Jack Kerouac by Robert Frank, and Walter Philip Reuther by Josef Breitenbach, a unique ca. 1845 calotype negative of Matthew Calbraith Perry by an anonymous photographer, and a daguerreotype of Franklin Pierce by Albert Sands Southworth and Josiah Johnson Hawes. Gifts included a hitherto unknown ca. 1845 daguerreotype of Jefferson Davis and a collection of original manuscript material relating to the final years and death of Mathew Brady. The Department also instigated the transfer from the Smithsonian Institution Libraries of a major album of ca. 1859 salt print portraits of President James Buchanan, his vice president and cabinet, and the leading members of the Senate and House--a unique and extremely important pictorial document of American politics on the eve of the Civil War.

Collections Management - With the assistance of volunteers, the curatorial files in the Prints and Photographs Department are being systematically reviewed and updated; this project will extend into FY 1988. The Meserve Collection inventory is being entered into the computer as the first essential step in generating a corrected, alphabetized index to the collection; and, simultaneously, a 35mm positive film strip of the Meserve Collection negatives is being made to facilitate access to the material. It is hoped that this project will be completed by the beginning of FY 1988.

A major collections management priority for FY 1988 will be reorganizing the storage of matted large prints, unmatted prints in boxes, and other cased objects (such as daguerreotypes) to make the most efficient use of the storage space newly made available by the purchase in FY 1986 of sophisticated new shelving units.

In FY 1987, the remainder of the Meade Brothers Collection of daguerreotypes (29 plates) were cleaned and reglazed in accordance with recommended procedures. For the reinstallation of the Meserve Collection gallery, historically correct albumen prints were made from the original negatives and sets of positive transparencies and facsimile negatives were made at the same time so that the fragile original glass plates no longer need to be handled in making routine prints. Major projects for FY 1988 included the commissioning of albumen prints from an anticipated gift of 16 Brady imperial negatives, as well as the printing of the calotype negative of Matthew Calbraith Perry and the reglazing and resealing of daguerreotypes in the collection which have deteriorating cover glasses. The Gallery also would like to establish a program for the systematic monitoring of the stability of objects in the photograph collection by scientifically sampling image-density levels on a periodic basis to determine whether changes are occurring.

Exhibitions - A major reinstallation of the Permanent Collection of the Portrait Gallery was completed during the first half of FY 1987. The reinstallation made the arrangement of the galleries more logical and placed many recently acquired portraits on permanent view for the first time.

The east wing of the first floor is now home to portraits of notable actors, singers, musicians and writers of the 20th century as well as sports figures. The mezzanine level is devoted to the Civil War era, and the second floor houses the Galleries of Notable Americans from the 17th century to the present. These period galleries surround a central area in which portraits of artists and writers are placed. The reinstallation was completed in May with the opening of "Stage Portraits: Photographs by Mathew Brady from the Frederick Hill Meserve Collection."

NPG also opened several temporary exhibitions in FY 1987. "TIME: Man of the Year" is the latest in a series of shows based on original artwork donated to the Gallery by TIME magazine of key world leaders and heroes. "The Art of Henry Inman," organized by guest curator Dr. William Gerdts, brought together over 100 of Inman's works for the first time since his untimely death in 1846, including his portrait of Angelica Singleton Van Buren, which has never before been exhibited outside the White House. "Selections from the American Academy and Institute of Arts and Letters" opened in late May and brought to the attention of the public portraits of key figures in the worlds of art, music and literature from the rarely-seen collections of the Academy. The exhibition was shown at the Academy in New York City in autumn 1987.

Two exhibitions of Recent Acquisitions were mounted in February and August. In spring 1987, the prints and drawings in "Like and Unlike: Portrait Caricatures by Henry Major and Herman Perlman" proved very popular with the public.

Much time and effort in FY 1987 was devoted to the creation of an exhibition commissioned by the United States Information Agency as part of the Cultural Accord between the People's Republic of China and the United States. The showing in China was aborted, owing to a conflict between the two governments; but in December 1987 the exhibition opened in Hong Kong, followed by a tour in Japan and the possibility of a tour in Spain. About 50 portraits are included representing the history of portraiture in America from 1884 to 1984.

The Gallery's FY 1988 schedule opened with a commemoration of the Bicentennial of the Constitution of the United States. "American Colonial Portraits: 1700 to 1776" portrayed the society in the New World Colonies from which the new United States evolved. The exhibition brought together for the first time in half a century masterworks of colonial portraiture, which showed the impact of artists from Europe and displayed the works of our first native-born portraitists. Portraits were borrowed from major American museums and individual owners, and from public and private collections in England, Ireland, Jamaica, Bermuda, and Canada.

Photographs by Julia Margaret Cameron, a 19th-century English artist, went on view in November 1987. This one woman show, consisting of portraits of famous Britons in the world of arts and letters, was lent by the J. Paul Getty Museum in California.

March 1988 will bring to the Gallery "The Artist's Mother: Portraits and Homages," an exhibition organized by the Heckscher Museum in Huntington, New York highlighting approximately 30 works of 20th-century artists, who use their mothers as the subject or inspiration for their work. In April, "Portraits from Gripsholm" will bring masterpieces from the Swedish national collections. This is the latest in a

series of shows displaying highlights from European national portrait collections and coincides with the 350th anniversary of the first Swedish settlement in the New World.

In the summer of 1988, an exhibition focusing on major sports figures who have appeared on the cover of TIME magazine will be presented. In September, an exhibition of photographic portraits made with Polaroid cameras will be featured.

The opening exhibition in FY 1989, "ON THE AIR, The Pioneers of American Broadcasting" will focus on the Golden Age of radio and television, and will be coorganized with the Museum of Broadcasting in New York City. In December, the first major exhibition devoted solely to the works of Winold Reiss, a German-born artist whose portraits of black Americans have long been popular with NPG visitors, will be mounted. Reiss, who came to America in the early 20th century, also painted and drew portraits of Native Americans, Asian-Americans and others of diverse ethnic backgrounds. "The First Federal Congress," jointly organized with the United States Senate and the United States House of Representatives, and "Portrait of the Law," opening in March 1989 and the fall of 1989 respectively, will continue the Gallery's celebration of the Bicentennial of the United States Constitution.

The National Museum of American Art/National Portrait Gallery (NMAA/NPG) Library has maintained a modest, but active, exhibition program. Notable among the FY 1987 activities was the exhibition titled "Highlights from the Downtown Gallery," commemorating the 60th anniversary of the founding of the Downtown Gallery, known for making the work of living American artists available to the populace. The majority of the materials on display are in the collection of the Archives of American Art.

There are currently over 200 objects on temporary and long-term loan from the National Portrait Gallery to other institutions across the country, as well as within the Smithsonian. Major loans have been made to the Library of Congress and the Daughters of the American Revolution (DAR) Museum in Washington, D.C.; the New York Public Library; Independence National Historic Park in Philadelphia; and the Huntington Galleries in West Virginia.

Exhibition loans for FY 1988 include a group of photographs to Israel for an exhibition of American photography, 19 portraits by Robert Vickrey that were used as covers on TIME magazine to the Canton Art Institute in Ohio and, the most important request, the loan of the portrait of Mary Cassatt by Edgar Degas to the Galeries Nationales du Grand Palais in Paris for a major loan exhibition on Degas. That exhibition will tour to the National Gallery of Canada in Ottawa and the Metropolitan Museum of Art in New York City.

Publications - National Portrait Gallery publications in FY 1987 included book-length studies associated with the exhibitions "The Art of Henry Inman," "Portraits from the American Academy and Institute of Arts and Letters," and "TIME: Man of the Year." The Smithsonian Institution Press published the TIME book as well as American Colonial Portraits 1700-1776, which accompanied that exhibition in the fall of 1987; and it will distribute the 25th-anniversary edition of the Permanent Collection Illustrated Checklist (in press 1987). Also in preparation are the ambitious, definitive study of C.B.J.F. de Saint-Memin, and, in connection with forthcoming exhibitions, books on masterpieces of Swedish portraiture (in both Swedish and English), the First Federal Congress, and the history of American radio and television. The publications program also includes brochures about individual exhibitions and about the museum, as well as the Gallery's quarterly Calendar of

Events. A major monograph on Mathew Brady is in preparation and will be completed before the end of FY 1988.

Education - The National Portrait Gallery's public education program continues to combine a daily schedule of docent-led tours with an array of intensive elementary and secondary school and senior citizen outreach programs (such as a musical tribute to Cole Porter) conducted by trained education aides and docents. While the local audience has been addressed for a long time, NPG's Education Department continues to explore ways to broaden its national outreach. In celebration of the Bicentennial of the Constitution of the United States, the Gallery developed two programs to be introduced to local secondary school classes in FY 1988: "Constitution Quest: Why A Navy?" developed jointly with the Navy Museum, Department of the Navy, and "The Constitution and the Presidency," which examines the ways in which the presidency has shaped and been shaped by the Constitution. The latter will also be produced in a version for gifted and talented students and will include a kit for national distribution to teachers.

In response to curriculum changes in local school systems, an existing program, "Westward Ho!," is now offered to upper elementary as well as secondary schools. In FY 1988, the Education Department also plans to update and computerize its mailing list, to increase teacher awareness of its programs through workshops, and to continue to examine and refine its existing programs.

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 order to address the congressional mandate to the Smithsonian to seek wider audiences in its public programming, "Cultures in Motion," a series of programs developed in conjunction with minority community groups, is in the planning stage.

The Education Department's "Lunchtime Lecture" series and "Speakers Bureau" service now attracts a broad regular audience, as well as visitors who have interest in particular subjects. The expanded "Special Lecture" series provides in-depth looks into the conceptualizing and assembling of exhibitions, often combined with personal insights into individual objects. "Let's Not Talk About Love" is an experimental program offered to senior citizens, which the Department is taking to senior citizen centers in Delaware, Pennsylvania, Maryland, and Virginia.

Research - In FY 1987, the Catalog of American Portraits (CAP) continued its mission of serving professional and non-professional researchers with inquiries concerning American history and American art history. Automation of portrait records continued to be a high priority and approximately 4,780 additional portrait records were added to the computerized database in the past year. Computer printouts and negatives representing these collections were sent to 45 institutions during this period. Approximately 5,000 skeletal records from the southern states survey were added to the database. In addition, portrait collections contained in the Worcester (MA) Art Museum, the New York Public Library, the Union League Club (NYC), Virginia Historical Society, the Jenkins Memorial Law Library (Philadelphia), and Randolph-Macon College (VA) were catalogued and, when necessary, photographed for our files. A CAP staff member continued to play a central role in the development of the Smithsonian-wide Collections Information System program.

Service to users will remain the first priority for CAP during the coming fiscal year. As available funding permits, field survey work will continue in selected

collections. Continuing effort will be made to secure funding for the completion of the national portrait survey.

The NMAA/NPG Library has acquired the microfilm collection of Emblem Books, a valuable iconographic reference source; The New York Public Library's Artists' File; Chadwyck-Healey's 19th Century, Visual Arts and Architecture; The American Biographical Archive; and The History of Photography a microfilm collection which contains 202 reels on photography from the International Museum of Photography holdings.

During FY 1987, work continued in transcribing, researching, and annotating selected letters and documents of Charles Willson Peale and his artist-sons Raphaelle, Rembrandt, and Rubens. Volume 2 of Selected Papers of Charles Willson Peale and His Family: The Artist as Museum Keeper, 1791-1810 was published by Yale University Press in January 1988; Volume 3--The Artist in Retirement, 1810-1820--is now scheduled to go to Yale in September 1988.

For FY 1988, the editor of the Peale Family Papers project has organized and developed funding for a subsidiary project to assemble and publish an annotated catalogue raisonné of the paintings of Rembrandt Peale, 1778-1860, an important 19th-century portraitist. Also planned is a symposium to be held in April 1988, in cooperation with LaSalle University, to mark the publication of Volume 2 of Selected Papers.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 1 workyear and \$65,000 is requested to provide for a computer systems manager (1 workyear and \$35,000), and to upgrade collections storage areas (\$30,000).

Computer Systems Manager (1 workyear and \$35,000) - For FY 1989, an increase of 1 workyear and \$35,000 is requested for a computer systems manager. Automation of the collections management process, budget and administrative support, and the necessity to access data on the Smithsonian central computer system increases the urgency of the need for a computer systems manager to guide the development of automation activities. The Gallery is woefully lacking in computer technology, which will continue until the services of a specialist are acquired. This individual will work with the Smithsonian's Office of Information Resource Management (OIRM) to implement the Smithsonian-wide Collections Information System (CIS) and will provide the attention required to design, establish and monitor programs specifically for NPG's needs.

Currently, each office in the Gallery has at least one microcomputer, and these are used substantially for tasks related to collections management. The computer systems manager will assure automated systems are compatible and will assure that the most efficient ways to accomplish computer tasks are used by Gallery staff. The manager also will have the responsibility for maintaining liaison with other offices of the Smithsonian concerned with automated data systems.

For several years, OIRM has recommended that the Gallery establish such a position, but sufficient workyears and funds were not available. If funds are not provided to obtain a computer systems manager, the Gallery's capability of providing competent collections management, budget and administrative support in a rapidly developing and highly technical field will be substantially diminished.

Upgrade Collections Storage Areas (\$30,000) - Conservation, storage and general maintenance of the collections are ongoing activities that have increased steadily

without an increase in basic support resources. Collection objects that cannot be accommodated in the Patent Office Building are housed in the Gallery's off-site storage facility located at 1111 North Capitol Street. This facility, 2,250 square feet, is inadequate both in terms of size and configuration and is in serious need of upgrading. Also, storage space is not available for a large portion of the collections, nor is sufficient temporary storage space available for the two to three large loan exhibitions produced each year.

To rectify this situation, the Gallery plans to renovate the storage facility at North Capitol Street and install storage screens and shelves. If NPG collections are to be responsibly managed, adequate off-site storage space must be provided. Failure to receive necessary funds will jeopardize approximately one-third of the NPG's 11,000 holdings, thus making it increasingly difficult to receive and to store objects for loan exhibitions.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from several sources including the Gallery's share of sales in the restaurant and museum shop, sales of photographic reproductions of portraits in the collection, staff honoraria, and participation fees from museums to which National Portrait Gallery exhibitions are loaned. These funds are used to help defray the expenses of public lectures, symposia and special events in coordination with the opening of exhibitions; associated costs of loan exhibition development and management; and the research expenses of staff who are preparing special publications or lectures.

Restricted Funds - These funds are received for specific purposes in the form of gifts and grants from individuals, foundations, organizations and corporations. The Gallery received a grant from the Morris and Gwendolyn Cafritz Foundation which funded the purchase of the portrait of Benjamin Franklin attributed to Joseph-Siffrein Duplessis. The painting is believed to have been commissioned by its first owner, Franklin's close friend and neighbor, Mme. Anne Louise Brillon de Jouy, around 1785, at the time of Franklin's departure from France. Other acquisitions were made possible this year by contributions from Barry Bingham, Sr., Mary P. Sears, Lydia de Polo, Jane S. Murray and Messrs. Jim and Ted Pedas. Among them were the portrait of Louis Brandeis by Samuel J. Woolf, a portrait of James Jones by Bernard Childs and a photograph of Douglas Fairbanks and Mary Pickford by Edward Steichen.

Mr. and Mrs. Max Berry and Count and Countess Frederic Chandon were among those who sponsored the reception to honor H.S.H. Prince Rainier III of Monaco on the occasion of the unveiling of the bust of Her Serene Highness Princess Grace by artist Kees Verkade. The bust was donated to the Gallery by Prince Rainier. The United States Information Agency and American Express International, Inc. provided funding for the showing of the aborted China exhibition, renamed "Then and Now: American Portraiture of the Past Century from the National Portrait Gallery, Washington, D.C.," at the Hong Kong Museum of Art. ProServ, Inc. enabled the Gallery to offer to the public at no charge the "Portraits in American Jazz" concerts by Saratoga Naturally Sparkling Mineral Water and Anheuser-Busch Beverage Group, Inc. CIGNA Foundation provided substantial support to advertising, promotion and publication of the catalogue for the Gallery's exhibition "American Colonial Portraits: 1700-1776." The Clarence and Jack Himmel Foundation contributed to the publication on portraits from the American Academy and Institute of Arts and Letters. General Dynamics Corporation, Mr. and Mrs. Joe L. Albritton, the Hechinger Foundation, The Oliver Carr Corporation, and Raleighs have made contributions towards the 25th-anniversary celebration of the

Gallery's founding. A number of smaller gifts have been received from individual donors.

In FY 1987, the James Smithson Society of the Smithsonian National Associates lent its assistance in acquiring an exceptional portrait of Rufus King by Gilbert Stuart. King was one of New England's most respected political figures of the early American republic. Also, Rembrandt Peale (1778-1860): A Catalogue Raisonné of His Works, a two-year project, has received a Smithsonian Scholarly Studies grant. The catalogue will be a listing of over a thousand works of art created by Peale and will contain complete information pertaining to date, sitter, record of ownership, exhibition record, and present location. Monies were obtained from the Smithsonian's Special Exhibition Fund in support of NPG's exhibition and catalogue "Faces of America: Portraits by Winold Reiss." The Gallery also received Educational Outreach Funds in support of its "Cultures in Motion: Perspectives on American Diversity" program. As an extension of NPG's successful "Portraits in Motion" lively arts series, this project will highlight the role of minorities in shaping American society.

Government Grants and Contracts - These funds are provided by various government agencies and departments for support of specific exhibitions.

HIRSHHORN MUSEUM AND SCULPTURE GARDEN

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	71	3,282	-	11	-	328	-	980	-	-
FY 1988 -Estimate	78	3,335	-	18	-	230	-	1,007	-	-
-Base	78	3,371								
FY 1989 Estimate	78	3,409	-	18	-	138	-	600	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	78	-	78
11 Personnel Compensation.....	2,065	29	2,094
12 Personnel Benefits.....	237	9	246
21 Travel.....	57	-	57
22 Transportation of Things.....	164	-	164
23 Rent, Communications & Utilities.....	7	-	7
24 Printing & Reproduction.....	100	-	100
25 Other Services.....	244	-	244
26 Supplies & Materials.....	219	-	219
31 Equipment.....	122	-	122
Collections Acquisition.....	150	-	150
41 Grants.....	6	-	6
Total	<u>3,371</u>	<u>38</u>	<u>3,409</u>

Analysis of Increase

Necessary Pay..... 38

ABSTRACT - The Hirshhorn Museum and Sculpture Garden (HMSG), a museum of modern and contemporary art, was established by an act of Congress (P.L. 89-788, November 7, 1966). Its collection, which numbers approximately 13,000 works, forms the basis of an active program of public exhibitions. The museum staff conducts extensive research, prepares catalogues, and offers a wide range of educational activities including slide and film programs, lectures, concerts, publications and tours. No

program increase is requested for FY 1989. Necessary pay of \$35,000 is required for existing staff, along with .12 workyears and \$3,000 required to annualize the partial-year funding of 1 part-time position approved in the FY 1988 budget.

PROGRAM - Since its public opening on October 4, 1974, the programs of the Hirshhorn Museum and Sculpture Garden have attracted one of the highest visitations of any contemporary art museum in the United States. In keeping with its status as one of the major museums of modern and contemporary art in the country, the HMSG carries out programs of research, exhibitions, collections management, acquisitions, deaccessions, and education activities involving audiences of all ages.

Research - The Museum's resources include works of art, a curatorial file providing information on artists and works in the collection, and a library with 35,000 books and exhibition catalogues. Works of art not on display are available for study purposes. Currently, the staff is researching the provenance of each work of art in the permanent collection. A system is being developed, using personal computers, that will ultimately allow researchers and the public to retrieve information, including a video image, concerning the collection.

Exhibitions - The Museum conducts an active exhibition program that draws upon its collection, as well as other collections. Approximately 700 works from the permanent collection are on display at any given time. The special exhibition gallery was increased in size by approximately 800 square feet in FY 1987 by moving the Museum Shop to the lobby of the building. In FY 1987, the Museum organized two exhibitions: "Recent Acquisitions (1983-1986)" and "Roger Brown." After its initial display at the HMSG, "Roger Brown" will travel to the La Jolla Museum of Contemporary Art, the Lowe Art Museum at the University of Miami, and the Des Moines Art Center. "Nancy Graves: A Sculpture Retrospective," organized by the Fort Worth Art Museum; "Morris Louis," organized by the Museum of Modern Art; and "Lucian Freud Paintings," organized by the British Council, were also shown in FY 1987.

Small exhibitions, organized by the Museum's staff and based on its collections, displayed in FY 1987 include: "David Levine: Caricatures," "Bridging the Century: Images of Bridges from the Museum's Collection," "Patterned Images: Works on Paper from the Museum's Collection," and "Arnold Newman Photographs Artists."

In FY 1988, with partial funding from the Smithsonian Institution's Special Exhibition Fund, the Hirshhorn is adding two new exhibition programs, "Directions" and "Works." "Directions"--recast from the Museum's large-scale biennial thematic show--will augment the special exhibitions mounted in the lower-level gallery with small group shows of works by emerging artists and solo exhibitions of specific bodies of work by better-known artists. This series of one-gallery exhibitions will bring into focus some of the most current issues emerging in the art of today. "Joel Shapiro: Painted Wood" the first of this series opened December 1 to be followed in March by "Sherrie Levine," and in June by "Robert Cumming."

The second program the HMSG will initiate is innovative in that it will integrate the Museum's building and grounds into the creative process. The HMSG will commission artists to visit the Museum and generate a temporary site-specific work to be on view for approximately ten weeks. The "Works" exhibitions will thereby introduce viewers to a group of artists who create art in a nontraditional way, as well as expand the Museum's limited temporary exhibition space to include the whole museum complex. "Works" opened in December with Sol LeWitt, and in March by Kate Ericson and Mel Ziegler.

In FY 1988, the Museum will organize two major exhibitions: "Alberto Giacometti" and "Different Drummers." After its initial display at the HMSG, "Alberto Giacometti" will go to the San Francisco Museum of Modern Art. "A Quiet Revolution: British Sculpture Since 1965," co-organized by the Museum of Contemporary Art in Chicago and the San Francisco Museum of Modern Art, and "Expressiv: Central European Art Since 1960," organized by the Museum of 20th Century Art, Vienna, will also be shown at the Hirshhorn. Several small exhibitions based on the permanent collection are planned by FY 1988, including "Sea and Shore" and "The New Spirit: Artist-Organizers of the Armory Show."

In FY 1989, the following major exhibitions will be shown: "Gerhard Richter" organized by the Art Gallery of Ontario and the Museum of Contemporary Art, Chicago; "Robert Moskowitz: 1959-1989" organized by the HMSG; and "Recent Acquisitions" organized by the HMSG. After its initial showing at HMSG, the Robert Moskowitz exhibition will begin a tour that includes the La Jolla Museum of Contemporary Art, La Jolla, California and the Museum of Modern Art in New York City.

Collections Management - The Museum inventories its entire collection on a regular cycle, with spot checks made at least annually. The Hirshhorn Museum has undertaken a review of its permanent collection in order to reshape the Museum's formerly private collection by deaccessioning and disposing of works of art that are judged to be duplicates, redundant, or of inferior quality. The proceeds thus accumulated have created a fund to be used for acquisitions. As specified by law, the Board of Trustees of the Hirshhorn Museum and Sculpture Garden approves all deaccessioning. Certain "special collections," numbering 700 objects, have been transferred to other parts of the Smithsonian Institution where they will continue to be attributed as a gift of Joseph H. Hirshhorn. The Board of Trustees, over a span of two years, has voted to deaccession 470 works of art. With the transfer and the deaccessioning, the permanent collection will number approximately 13,000 objects.

Acquisitions - The legislation establishing the HMSG described the Museum's function as a "museum in Washington, D.C. where modern art could be exhibited and studied...[to]...enrich the culture of the Nation." In order to carry out this mandate, it is essential that the Museum's collection always includes contemporary art and that the Museum keep abreast of current developments in the visual arts. To present an accurate account of developments on an international level, an active acquisitions program is essential. In FY 1987, the Museum was able to add three works of art purchased with appropriated funds: "Untitled" by Ellsworth Kelly; "The Glass House for the Mobile Figure" by Walter Pichler; and "Untitled" by Joel Shapiro. Purchases with nonappropriated funds include: "Night Portrait" by Lucian Freud; "Angst" and "Cubist Bust" by Oto Gutfreund; "Coral Tree" by Robert Helm; "Untitled" by Jannis Kounellis; "Rubblings From the Calcium Garden...Reshoft" by Irving Petlin; "2-2-1: To Dickie and Tina" by Richard Serra; "Gymnast III" by William Tucker; and "Acceptablelevels" by William T. Wiley. "Seguidilla" by Man Ray was purchased with Federal and nonappropriated funds.

Education and Public Orientation - To increase visitor appreciation and understanding of specific exhibitions and of modern art in general, the Museum provides visitors with a variety of educational materials, including explanatory wall labels, posters, and brochures. The latter range from a single page to illustrated mini-catalogues and are distributed free of charge to the public. Posters using images from the HMSG permanent collection are sold in the Museum Shop.

Several film series are offered, including a lunch-time series about artists and their work, an evening series by artist filmmakers, and a Saturday series for young people. The Sandoz Corporation awarded the Museum funds to wire the auditorium to improve the sound for the hearing impaired. Events held in the auditorium include concerts by the 20th Century Consort and lectures by artists, critics, and art historians. Occasionally, symposia are organized in connection with exhibitions.

An orientation center was opened to the public in FY 1987. The J. Paul Getty Trust awarded the Museum a grant to produce a "Survey of Modern Art from the Museum's Permanent Collection." This slide presentation will be shown in the orientation room on the lower level of the Museum. When available this space will be used for slide or video presentations related to the major exhibition on view.

"Currents," two free seminars for high-school juniors, was developed by the Museum as a program to familiarize students with trends and ideas represented in new works of art. Exploring the interrelationship of current history and art, the two and one-half hour program includes intensive gallery study, a slide overview, and informal discussions. The comments and observations of the students are published and made available to the public as a free exhibition handout.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided from several sources, including the Museum's share of sales from the museum shop and plaza cafe. An allotment is provided for the expenses of the Museum's Board of Trustees. Furthermore, funds are made available to support partially the 20th Century Consort, which has been performing at the Hirshhorn Museum for many years.

Restricted Funds - In order to restore to the Hirshhorn Museum and Sculpture Garden its art acquisition funds, which with the approval of the donor, Mr. Hirshhorn, were used for construction costs in 1973 and 1974, the Smithsonian Institution in FY 1986 established a restricted endowment fund for the Museum in the amount of \$2.5 million. Concurrently, a special purpose fund was also established in the amount of \$700,000 to be used immediately for art purchases. The Museum has established a fund for the proceeds from deaccessioned works of art sold at auction, which will be used to purchase new art works for the permanent collection. The Board of Trustees has agreed that up to ten percent of the amount in the endowment income fund and the auction proceeds fund as of October 1 of each year may be used for the purchase of works of art. In addition, the Museum has raised outside support from various sources to help acquire important major works for the permanent collection.

The Xerox Corporation and Credit Suisse have pledged to support the major exhibition, "Alberto Giacometti." In addition, Balair/Swiss has agreed to provide transportation and shipping. The Sandoz Corporation awarded a grant to be used to wire the auditorium to make it accessible to the hearing impaired. The La Jolla Museum of Contemporary Art, the Des Moines Art Center, and the Lowe Art Museum at the University of Miami have signed contracts to cover the costs of their showing of the "Roger Brown" exhibition. The J. Paul Getty Trust provided funds to create an audio-visual presentation on modern art to be shown in the orientation room.

CENTER FOR ASIAN ART

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	57	3,941	1	153	-	26	22	2,158	-	-
FY 1988 -Estimate	67	3,899	1	90	-	1	22	1,528	-	-
-Base	67	3,932								
FY 1989 Estimate	68	4,292	1	91	-	-	22	1,524	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	67	1	68
11 Personnel Compensation.....	1,830	46	1,876
12 Personnel Benefits.....	232	14	246
21 Travel.....	31	-	31
23 Rent, Communications & Utilities.....	53	-	53
24 Printing & Reproduction.....	249	-	249
25 Other Services.....	460	-	460
26 Supplies & Materials.....	600	-	600
31 Equipment.....	373	300	673
Collections Acquisition.....	104	-	104
Total	<u>3,932</u>	<u>360</u>	<u>4,292</u>

Analysis of Increase

Necessary Pay.....	60
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ABSTRACT - The Center for Asian Art is comprised of the Freer Gallery of Art, established May 5, 1906, and the Arthur M. Sackler Gallery, established July 28, 1982. Both galleries are devoted to the acquisition, study, conservation, interpretation and exhibition of Asian art. The Sackler Gallery, which opened to the public on September 28, 1987, has an exhibition program that includes temporary loan exhibitions to and

from other organizations which is not possible at the Freer because of the terms of the founder's will. The Freer Gallery of Art has a continuing program to display its collections as keys to understanding the civilizations that produced them. For FY 1989, an increase of \$300,000 is requested: for collections storage equipment (\$150,000) and furnishings and equipment for the Technical Laboratory (\$150,000) for the Freer Gallery. Necessary pay of \$31,000 is required for existing staff, along with 1.25 workyears and \$29,000 required to annualize the partial-year funding of 5 new positions approved in the FY 1988 budget for the Sackler Gallery.

FREER GALLERY OF ART

PROGRAM - The Freer Gallery of Art houses one of the most distinguished collections of Oriental art in the world. The collection consists of over 27,000 works of art from China, Japan, Korea, India and the Near East and spans 5,000 years. Included in the collection are paintings; sculptures and other objects in stone, wood, lacquer, jade, pottery porcelain, bronze, gold and silver; and Biblical manuscripts. "The Peacock Room" by James McNeill Whistler is a highlight of an outstanding collection of American art that Charles Lang Freer, the Gallery's founder, considered a bridge between the arts of the East and West. Items not currently on exhibition are available to students and scholars for study. In addition to the collections, the Gallery shares with the Sackler Gallery a public library of approximately 45,000 volumes relating to the objects in the collections.

The unique Oriental collections in the Freer Gallery, together with notable holdings of American paintings, have made the museum increasingly a center for students, scholars and the general public. This growing interest has been manifested in a steady increase in visitors, in requests for museum tours, lengthy periods of advance bookings for authentication appointments, and the number of visiting scholars and dignitaries.

Research - Freer Gallery research facilities, comprising the collections, curatorial staff, library and technical conservation laboratories, form the nucleus of its specialized public service. Research findings are made available to the public through exhibitions, catalogues of exhibitions, articles, free gallery leaflets and public lectures at the Freer as well as at other similar institutions. Updating the research files on individual pieces in the collection continues. These files are made available to visiting scholars and students as well as the general public.

The results of curatorial research are most visible in the Gallery's exhibitions through labels and leaflets. However, additional research results made available to the public can be found in collection research records, in lectures, and in published papers and books.

Exhibitions - The Freer collections of Chinese art are represented in an exhibition of a dozen of its finest paintings, a selection of ceramics and bronzes, the earliest dating to the second millennium B.C., and lacquerware.

The installation of Japanese art includes a diverse group of 13 paintings, spanning the late 12th through the 19th centuries; 40 ceramic objects; two pieces of lacquerware, and two early bronzes offering an opportunity for visitors to compare objects in several media. A selection of screens is on view in the screen gallery.

Paintings and a wide array of objects in silver, gold, ivory, jade, brass, steel, ceramic and glass reflect the quality and diversity of the Freer's collection of Near

Eastern art. Objects in the exhibition date from the 5th century B.C. through the 18th century and come from North Africa, Egypt, Syria, Iraq, Iran, India and Turkey.

Eleven sculptures of stone and bronze and five paintings fill the South and Southeast Asian gallery with representations of Buddhist and Hindu gods from the Indian subcontinent and Indonesia, and span the second century B.C. through the 17th century. Among the highlights is the Freer's famous "Parvati," a 10th-century bronze representing the consort to Shiva, Hindu god of destruction. Another bronze, this one made in the 13th-14th century, is "Nandi," the bull who was both "vahana" (vehicle) for and companion to Shiva.

Although the Freer is best known for its holdings in the arts of Asia and the Near East, it also houses a collection of works by American artists of the late 19th and early 20th centuries, including a major group of works by the expatriate artist James McNeill Whistler. The current selection exhibited includes 17 paintings by Whistler, Dwight William Tryon, Thomas Wilmer Dewing and John Singer Sargent.

In addition, 19 paintings represent the American artist best known for his graceful representations of women. Dewing, born in Boston in 1851, studied art in Paris in the French academic tradition. In the United States in 1895, he helped to found a group called "The Ten American Painters," also known as the American Impressionists. Unlike his peers who found landscape painting the appropriate vehicle for expressing innovative ideas about light and color, Dewing used landscapes primarily as backgrounds for his elegant figural interpretations.

In 1973, the Freer published a catalogue, Chinese Figure Painting. This was the only study in this field, and it has been out of print for nine years. Revision of this text for publication has necessitated a comprehensive review of all literature on that subject during the past 14 years, including scholarly developments evolving out of the original publication.

The Technical Laboratory of the Freer Gallery is renowned for its research activities, in addition to the ongoing conservation and restoration of objects in the collection, and to the examination of potential collections acquisitions. In the past year, the staff of the Technical Laboratory has been primarily concerned with the conservation of the objects for the inaugural exhibitions in the Sackler Gallery. Environmental control of the Sackler exhibition galleries and collection storage areas also required attention.

Research in the area of conservation concentrated on the extension of identification methods into the field of organic colorants in paintings and the lead isotope ratio analysis of Chinese bronzes in the Sackler collections. Specific Freer research included the study of unusual copper green pigments on Ukiyo-e paintings, "lead white" on Japanese paintings, identification of pigment samples taken from excavated objects (dated to the 5th-8th centuries A.D.) in Korean museums, microscopic identification of paper fibers from very small samples, and investigation of the metallurgy and properties of high-tin bronzes, including reconstructing the alloy and production methods used in making high-tin bronze mirrors from Aranmula, India.

Collections Acquisitions - A sum of \$100,000 was appropriated for the first time in FY 1985 for collections acquisitions for the Freer Gallery. FY 1987 Federal funds were used to purchase an Indian metalwork piece dating circa 1650-1700. In addition, a Korean lacquer box with inlaid mother-of-pearl from the 17th century was purchased with Federal funds. Purchases for the collection with Freer nonappropriated Trust

funds include: a Tibetan gilt-bronze figure from the 13th-14th century; two Korean ceramic jars from the Three Kingdom Period (3rd-4th century, A.D.); an Indian lacquer pen case, dated 1587; a Japanese hanging scroll titled "Peach Blossom Spring," by Tani Buncho (1764-1840); a Chinese 14th-century Ming dynasty blue-and-white plate, an Indian painting of Krishna from the early 16th century; a Chinese Ch'ing dynasty calligraphy; a Japanese Edo period (1718-1804) calligraphy and a 15th-century Annamese ceramic dish.

Education - The Freer Gallery carries out a wide range of research and scholarly activities made available to the public in a number of ways. The popular lecture series held each year at the Freer has been temporarily discontinued until after the completion of the renovation. However, free introductory brochures are given to the visiting public and mailed to individuals and groups who write for general information on the Freer. Additional educational offerings include a free introductory brochure for the visually impaired; the continuation of the highly successful free exhibition leaflets introducing various aspects of the Gallery's collections; and the tours given by docents. In FY 1987, over 20,000 visitors joined the weekday and weekend tours given daily.

Educational outreach continues through a new education program being developed for the elderly and the young. Currently, slide sets are available for docents to speak to community groups. Pre-visit education packets are sent to schools prior to their tours of the Freer Gallery. Tours covering specific areas of the collection are presented to school and community groups studying these areas of Asian art.

Renovation Project - In FY 1988, work will begin on a two-year, multi-million dollar construction project that will provide underground passage between the Freer Gallery of Art and the Arthur M. Sackler Gallery, and excavation work to provide additional space for the storage, conservation and technical study of Asian and Near Eastern art. The expansion is required to allow convenient access between the Freer and Sackler for visitors as well as staff, who have responsibility for the collections of both museums; to serve a growing need for specialized Asian art conservation due to the Sackler Gallery's regular schedule of loan exhibitions; and, finally, to accommodate safely the Freer collections, which have nearly doubled since the museum opened in 1923.

When actual construction begins in 1988, only a portion of the public exhibition areas will be immediately affected. However, by the end of FY 1988, it will be necessary to close the building to the public. The completely refurbished Gallery should reopen in 1991.

Expanded facilities will be "carved out," literally, from beneath the Freer courtyard, as well as from unused space in its basement and sub-basement. The courtyard must be excavated for the construction of the Sackler-Freer passage, so it is economical to expand the excavation to gain needed additional space at the same time.

The project will increase the Freer's collection storage area by 70 percent, to 11,500 square feet; provide well over 1,000 square feet of additional exhibition space in the Freer section of the passageway between the two buildings, and increase the conservation facilities on the Freer's ground level from 1,750 to 5,765 square feet. In addition to the renovation of other areas, improved access to the galleries for visitors with physical disabilities will be provided by a passenger elevator from a ground-level entrance and lobby on the south side of the building.

ARTHUR M. SACKLER GALLERY

PROGRAM - The primary goal of the Sackler Gallery is the advancement of the scholarly appreciation and public knowledge of Asian art. Towards this end, the late Dr. Arthur M. Sackler donated a collection of nearly 1,000 objects in the fields of Chinese, Indian, Southeast Asian, and Near Eastern art to the Smithsonian. This collection includes Chinese jades spanning a period from Neolithic times (5000 B.C.-1500 B.C.) into the 19th century; Chinese bronzes from the Shang (ca. 1523 B.C.-ca. 1028 B.C.) through the Han (206 B.C.-A.D. 220) dynasties; Chinese painting; Chinese lacquer, Near Eastern ceramics and metalwork, and sculpture from Cambodia, India and Thailand. The public opening of the Sackler Gallery took place on September 28, 1987.

Research - Research is the fundamental focus of the Sackler Gallery, providing the basis for exhibitions, publications and collections acquisitions. The research program involves both visiting scholars as well as the curatorial staff.

Additionally, the Asian art history journal Artibus Asiae, now totally funded by the Sackler Foundation, is sponsored by the Gallery (although its contents are independent of the Sackler Gallery programs and collections). Exhibitions, exhibition catalogues and lectures at the Gallery are generated from specific research projects. The Gallery's publications program also includes a quarterly bulletin, Asian Art, intended for the general public. The bulletin has color plates and informative text relating to the permanent collection, recent acquisitions and special exhibitions. Free leaflets are provided in the exhibition galleries.

Conservation - The Sackler Gallery has a responsibility to protect and conserve the art objects under its purview. This includes the objects in the permanent collections, in loan exhibitions held in the Gallery and in Sackler-organized traveling exhibitions. Following the long practice of the Freer Gallery, the Sackler conservation effort includes object research to understand the origin of objects and therefore better develop the proper treatment of them. Expansion of the conservation facilities in a renovated Freer building will accommodate the requirements of the Sackler programs. During FY 1987, the staff of the Technical Laboratory has been primarily concerned with preparing the objects of the Sackler gift for exhibition. X-ray fluorescence equipment as well as x-radiography for occasional radiographs are being used for analysis of the Sackler objects.

An expanded Asian art painting conservation program also is being planned. The painting restoration studio takes a more traditional approach toward the conservation of East Asian paintings and screens than do Western conservation laboratories. Besides the work related to the Sackler collections and exhibitions, the Studio also looks forward to a future program to train Americans in order to alleviate the critical shortage in this country of persons skilled in this specialized field. There are only three facilities in the United States capable of restoring and mounting rare East Asian paintings and screens, and they are occupied fully with the works in their respective museums.

Exhibitions - An extensive exhibition program in the new building displays the initial Sackler gift together with other major objects on loan from the private collection of Dr. Sackler. The inaugural exhibitions include "In Praise of Ancestors: Ritual Objects from China," "Monsters, Myths and Minerals," "Pavilions and Immortal Mountains: Chinese Decorative Art and Painting," "Nomads and Nobility: Art from the

Ancient Near East," "Persian and Indian Paintings: Selections from a Recent Acquisition," "Temple Sculptures of South and Southeast Asia," and "Chinese Buddhist and Daoist Imagery."

Future exhibitions will include those originated by the Gallery as well as traveling exhibitions organized elsewhere. Exhibitions will be drawn from international public and private collections as well as from the Sackler collection. It is expected that many Gallery-organized exhibitions will travel to other museums and institutions. Future exhibitions will include "The Chinese Scholar's Studio," "A Jeweler's Eye," an exhibition of Persian and Indian paintings, "Tamerlane and the Princely Arts," "Masterpieces of the Che School Painting," "Mughal Gardens," and "Photographs by Raghubir Singh." Under consideration for future exhibitions are Chinese mirrors, Ordos bronzes, Chinese lacquer, Indian and Southeast Asian sculpture, Chinese garment hooks, Sasanian metalwork, Chinese furniture, Near Eastern ceramics, Far Eastern ceramics, Chinese sculpture, and Japanese art. Research catalogues will accompany these exhibitions.

Education - In addition to the publication programs, the Sackler Gallery has attracted a large number of research scholars and will have an active program for awarding research fellowships. Fellowship recipients work closely with curators on topics related to the collections. 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, provided two to three post-doctoral appointments each year beginning in 1985 and continuing through 1988. The Rockefeller Residency Program differs from existing fellowship programs in that it allows the fellows direct involvement in the plans and programs of the museums, and participation in symposia, exhibitions and publications.

Other such scholarly grant programs are being explored to further the research and education programs that will utilize the collections and exhibitions at the Sackler as well as enhance the scholarship of Asian art. Additional education programs include an Asian music concert series, docent tours, Saturday storytelling for children, and monthly curatorial lectures.

A classroom in the Sackler Gallery will be used in conjunction with local schools, colleges and universities. Programs have been developed to allow students at secondary, undergraduate and graduate levels to participate in symposia and seminars and come into direct contact with major works of art and distinguished scholars and curators.

Collections Acquisition - The Sackler Gallery will continue to acquire art objects in those fields of central interest to the museum, e.g., the arts of Asia in its broadest terms, from Japan to the Near East. Objects acquired for the collection in the future will continue to be of high quality with respect to esthetic standards, cultural history and physical condition. Objects may be acquired by gift, bequest or purchase provided that they meet established acquisition criteria. Gifts to the collection during FY 1987 included 26 Aditi (Indian) terracotta figures and doors, six Indian Mughal paintings, two Japanese ceramics and six Japanese prints.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of \$300,000 is requested: for collections storage equipment (\$150,000) and furnishings and equipment for the Technical Laboratory (\$150,000) for the Freer Gallery.

Collections Storage Equipment (\$150,000) - Over a period of five years, \$2.76 million will be required for furnishings and equipment of the renovated basement and sub-basement of the Freer Gallery. The initial request of \$100,000 for collection storage equipment for the Freer was approved by Congress in FY 1988. The additional amount of \$150,000 requested in FY 1989 will be used to continue furnishing the Freer Gallery's storage space with storage cabinets and related facilities, study furniture, computer terminals and teaching equipment.

With over 27,000 objects available for exhibition in the Freer collection, the impetus for the construction of the Quadrangle project came in part from the search to modernize and expand the storage of the collection. For 65 years, most of the collection was housed in wood and glass cabinets that are built into the various storage spaces. Almost all of these cabinets will be destroyed in the course of the renovation. Where possible, the existing metal cabinets will be retained. This includes the original metal cabinets for jades and for pottery shards used in Charles Freer's home. In both cases, however, there is a need for additional metal cabinets for these objects. The larger storage facilities which are planned will also permit more scholars and groups of students to see different parts of the collection at the same time which was not always feasible in the past. The greater space in the new storage cabinets will allow the objects to be stored less densely and thus more safely.

The renovation project for the expansion of the Freer Gallery storage facilities was conceived in the 1960s and is one project that has had Institutional priority for decades. Modernized facilities to house the collections are needed to improve the research environment. Of equal priority is to ensure an appropriate level of care in the preservation of the National Collections.

Furnishings and Equipment for the Technical Laboratory (\$150,000) - The requirements of the Oriental Art Conservation Studio are labor intensive using traditional techniques involving the use of hand tools. In contrast the activities of the Technical Laboratory include the chemical analysis of materials used in paintings and the use of X-ray defraction for viewing old repairs and original construction, each of which requires the use of sophisticated equipment. The increase of \$150,000 to fund equipment needs is required not only to replace aged equipment with more sophisticated instrumentation in the Smithsonian's first art conservation laboratory but also to meet the needs of the expanded programs of the Arthur M. Sackler Gallery.

In part, these special needs for the Sackler Gallery are due to the expanded traveling program of international loan shows which include works as bronzes from Russia, and items from Turkey and from the Shanghai Museum. Occasionally, upon the arrival of a show, the Technical Laboratory may need to repair an item as either a condition of the loan or as a result from damage while in transit. This conservation task becomes more difficult and time consuming without the necessary equipment.

This increase will supplement existing base funds of \$50,000 which is only capable to fund supplies and maintenance costs of current equipment. Examples of some equipment needs are the following: an X-ray fluorescence analyzer, costing \$100,000; a metallurgical microscope which is used to investigate metallic objects and their microstructure, costing \$50,000; a reflectance spectrophotometer for investigating and recording the color of paintings, costing \$30,000; and an operating stereomicroscope, costing \$20,000.

The use of modern equipment makes new research possible. For example, the X-ray fluorescence analyzer is an instrument capable of conducting chemical analysis of an object without taking samples. Currently, in order to engage in this kind of study, conservators in the Technical Laboratory must travel with object in hand to an analyzer at a laboratory off-site since one is not available at the Smithsonian. Staff run the risk of damaging an object that may be a National Treasure. With an analyzer on site, damage to valuable objects will be greatly lessened while study can be significantly increased. The equipment will also be available to other Smithsonian labs. This request falls in line with the Secretary's emphasis in maintaining and improving technical assistance, equipment and facilities which support collections-related and original conservation research.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided from allotments and are used to defray the costs of special events associated with the opening of new exhibitions and to cover the travel costs of members who attend the Freer and Sackler Visiting Committee meetings. These funds also support the position of coordinator for special programs in the Center.

Restricted Funds - The major portion of the nonappropriated Trust funds used by the Freer stems from the Charles Lang Freer bequest and is restricted by the conditions stipulated in that document. The funds are used to help finance the Freer's professional curatorial staff, administrative staff, acquisitions for the collection and library, the maintenance of the Freer's courtyard and the operation of the Freer museum shop. Funds from the Harold Stern Memorial Endowment support scholarly research in the field of Japanese art. Funds from the Forbes Fund, created by the late John Thacher, are provided to further conservation by supporting a fellowship in the area of conservation at the Freer Gallery.

ARCHIVES OF AMERICAN ART

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	21	1,057	-	87	-	6	12	774	-	-
FY 1988 -Estimate	19	1,038	-	108	-	20	12	945	-	-
-Base	19	1,050								
FY 1989 Estimate	20	1,100	-	98	-	-	12	826	-	-

* FTE = Full-time equivalent

** FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	19	1	20
11 Personnel Compensation.....	680	31	711
12 Personnel Benefits.....	84	9	93
21 Travel.....	22	-	22
22 Transportation of Things.....	2	-	2
23 Rent, Communications & Utilities.....	20	-	20
24 Printing & Reproduction.....	30	-	30
25 Other Services.....	132	-	132
26 Supplies & Materials.....	32	2	34
31 Equipment.....	48	8	56
Total	1,050	50	1,100

Analysis of Increase

Necessary Pay.....	11
Program Funds.....	39

ABSTRACT - The Archives of American Art is a national research bureau with regional centers located throughout the country. The Archives, which holds more than nine million documents, 400,000 photographs, 75,000 works on paper, and approximately 3,000 tape recorded oral history interviews, is the Nation's largest repository of documentary and source materials relating to the history of the visual arts in the United States. The original material in these collections is housed in Washington, D.C., while microfilm copies of the collections are held in regional centers in Boston, New York, Detroit, San Francisco, and Los Angeles. In addition, special

collecting projects are active in Philadelphia, Chicago and the South. The Archives also sponsors symposia, lectures, and other public programs; conducts an active membership program; and publishes a quarterly journal. For FY 1989, an increase of 1 workyear and \$39,000 is requested to hire an archivist and to fund related support costs. Necessary pay of \$11,000 is required for existing staff.

PROGRAM - Founded in 1954 as a private institution in Detroit, the Archives became a bureau of the Smithsonian in 1970. The Archives of American Art promotes the study of American art and cultural history by assembling and preserving an ever expanding collection of letters, diaries, sketchbooks, business papers, photographs, oral history interviews, drawings, and prints. In making these resources and other forms of primary records available to researchers and the public, the Archives advances the scholarly analysis and interpretation of the arts in America.

Research - Most research conducted at the Archives of American Art is done by graduate students, museum curators, college and university faculty members, art gallery staff, and free-lance art historians. In FY 1987, individuals representing these groups paid 3,300 research visits to the six Archives regional centers and borrowed 1,800 rolls of microfilm. While no measurement of the knowledge, facts, and insights gleaned from the use of Archives holdings is available, access to the collections is reflected in acknowledgements and footnote citations in more than 200 books, articles, exhibition catalogues, and dissertations published or completed during the year. Much of the Archives' staff research is directed toward the acquisition and description of new material, but it results in articles, papers delivered, exhibitions, and symposia as well. The quarterly Archives of American Art Journal serves as a medium for scholars and staff publication and regularly carries articles written by the regional directors.

Development of Collections - Acquisitions made in 1987 by the Archives of American Art have a high level of research value for art historians. Among the 250 collections received were the extensive records of the Milch Gallery in New York, which handled the work of contemporary artists from the early 20th century to the 1970s; the records of Victor Spark, a New York dealer who specialized in 19th-century American paintings for nearly 50 years; and the records of the National Arts Club, an artists' social and professional organization founded in 1898.

Individual artists whose papers will be especially welcome to art historians are sculptors Robert Smithson and Harry Bertoia; and painters Abraham Rattner, Morris Louis, Hugo Gellert (who died last year at the age of 94), and Alphaeus P. Cole (who is still living at the age of 112). The Archives also acquired useful groups of letters written by such major figures as Alexander Calder, William Glackens, George Grosz, William James, Stanton MacDonald-Wright, Henry Miller, Clyfford Still, and Edward Weston. A diary kept by Lucia Fairchild Fuller has lengthy passages describing John Singer Sargent; and a two volume history of American art, published in 1834, has corrective and irritated marginal notes by Thomas Cole, founder of the Hudson River School.

Collectors, art historians, and museum curators now represented by voluminous collections of papers at the Archives, are the Cone sisters of Baltimore, Lloyd Goodrich, Holger Cahill, and Dorothy Miller. The Oral History Program was strengthened in 1987 through taped interviews with Richard Diebenkorn, Lux Feininger, George Goodspeed, Hassel Smith, and Millard Sheets.

The Archives' documentary surveys in Philadelphia, Rhode Island, and the southern states were completed in FY 1987, and the microfilming of selected papers is under way. The Chicago survey of institutional holdings also was completed, with concentration now being given to privately held collections. Special collecting projects in Philadelphia and Chicago remain active and funded by grants. Another kind of survey, undertaken to determine gaps in the oral history collection, identified over 300 prominent national art world figures whose recollections should be recorded, some of them without delay. A foundation grant for that purpose will be sought in FY 1988.

Exhibitions - The main Archives' exhibition of FY 1987 presented photographs, letters, and other documents on the Bauhaus School in Germany and its influence on American design. Held at the Boston Public Library, the exhibition was accompanied by an explanatory checklist of the items shown. Several museum art exhibitions at Yale University; the Art Institute of Chicago; the Anchorage, Alaska, Museum of History and Art; the U. S. Naval Academy; and the Currier Gallery of Art in Manchester, New Hampshire drew heavily on Archives' materials. Preparations are being made for a FY 1988 exhibition of documentary items to be mounted in New York in connection with the 75th anniversary of the Armory Show of 1913.

Public Education - Most of the Archives' educational activities are directed towards scholars, students, and members of the public who take a serious interest in American art and cultural history. The Archives' Journal is the chief means of reaching that community, and its articles, reviews, reports, and edited documents offer substantive information in an appealing format. In 1987, with the assistance of the Office of Telecommunications and a foundation grant, the Archives produced a 25-minute film explaining the purpose and operations of the Archives. Two symposia are being prepared for FY 1988--one on the impact of modernism in Chicago prior to 1940 and the other on the art community in northern California in the first half of the 20th century. Members of the staff regularly deliver public lectures on aspects of American art and the Archives itself. The Archives also sponsored five informal seminars in which art historians discussed the problems and results of their current research.

Conservation and Care of Collections - With funds appropriated by Congress in FY 1986 specifically for conservation, the Archives continues its systematic program for the repair and preservation of especially valuable objects in its collections. Seventy-four works of art on paper, photographs, scrapbooks, and rare publications were given professional treatment at a leading conservation center in Philadelphia. The computerized inventory of the collections, a long-term project under congressional mandate, proceeded during the year. A four-person team devotes itself to this activity and two other staff members concentrate on the detailed cataloguing of works on paper and photographs.

EXPLANATION OF PROGRAM INCREASE:

Archivist (Registration) and Support (1 workyear and \$39,000) - For FY 1989, an increase of 1 workyear and \$39,000 is requested to strengthen collections management and research support activities by providing the Archives with an archivist to organize and manage its registrarial and cataloguing functions.

The mission of the Archives of American Art, now in its 33rd year, is to provide vital documentary material for and to encourage original research in American art and cultural history. The Archives has approximately nine million items in its

collections; it receives annually some 250,000 new items (in some 250 collections) from throughout the United States.

An archivist is essential to provide adequate control of the collections, to maintain acceptable standards for recording movement and use of the collections, and to manage the necessary record keeping. The work of the requested position has been performed by various technicians, which diverts them from their principal duty of preparing collections for research use. This has contributed to a large backlog of collections not readily available for research use and not properly organized and housed.

The archivist (registration) will also be responsible for developing and managing the Archives' automation system to provide control over movement of all collections. Such control begins with the receipt of materials at regional centers, shipment to Washington, D.C. for final processing, including movement in and out of off-site storage, and shipment of individual items for conservation treatment and exhibition use. The archivist will formulate policies and procedures necessary to implement this integrated automation system and train staff members in the use of the system. When the system is fully operational, Archives' managers will have an accurate and complete picture of the current status of all archival functions.

In addition to handling incoming new collections, the archivist (registration) will oversee the preparation, insurance, packing and shipping of an estimated 250 individual items from the permanent collection each year. These original items--often among the most valuable materials in the collections--are shipped for use in museum exhibitions and catalogues, for photoreproduction, and for conservation treatment.

The increase requested will be used to hire an archivist (registration) (1 workyear and \$29,000) and to fund necessary support costs, including a computer station, software, and supplies (\$10,000). In FY 1990, additional funds will be sought for support of registration functions, including matting and packing materials for proper shipment of fragile items, shipping, communications, and travel.

Because base resources are not available to support this position, the work has been performed by various technicians reassigned from their principal duty of preparing collections for research use. The additional archivist will enable the Archives to respond more effectively and quickly to research needs and to assure that control of collections meets professional and Smithsonian Institution standards.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided through annual allotments to defray costs associated with special events, supplement travel expenses incurred by the Archives' Board of Trustees, and to provide partial support for general operating costs. With full support from a special purpose fund, the Archives will publish in FY 1988 its new edition of From Reliable Sources, a publication which is the chief means of informing the public of some of the important documents in the Archives' collections, the use of documentary records in historical research, and the role of the Archives in preserving the records of American cultural history.

Restricted Funds - These funds are generated through fund-raising activities, gifts, as well as foundation and corporation grants, and a membership program. A

substantial portion of this income is used to support the Archives' general operating expenses, its oral history program, and publications program.

Foundation and corporate grants have provided the principal sources of support for special projects. The Archives of American Art's field collecting activities in Los Angeles, Chicago, and Philadelphia will continue through FY 1988 because of successful fundraising in these geographical locations. Major grants from The J. Paul Getty Trust and The Andrew Mellon Foundations will underwrite the costs to automate and refine the catalogue of the Archives of American Art collections. In addition, the Archives of American Art Board of Trustees continues to supplement income for the general operations of the Archives through its Wellin Taubman Reserve Fund established in FY 1986.

COOPER-HEWITT MUSEUM

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	32	1,077	19	825	7	1,495	1	724	-	76
FY 1988 -Estimate	30	1,074	19	861	7	1,266	1	835	-	50
-Base	30	1,089								
FY 1989 Estimate	31	1,193	19	897	7	1,274	1	689	-	50

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	30	1	31
11 Personnel Compensation.....	827	39	866
12 Personnel Benefits.....	116	11	127
21 Travel.....	4	-	4
23 Rent, Communications & Utilities.....	17	-	17
25 Other Services.....	74	54	128
26 Supplies & Materials.....	50	-	50
31 Equipment.....	1	-	1
Total	<u>1,089</u>	<u>104</u>	<u>1,193</u>

Analysis of Increase

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ABSTRACT - Since its public debut in October 1976 as the Smithsonian Institution's National Museum of Design, the Cooper-Hewitt Museum has been a pioneer in the innovative exploration of the products and processes of the arts of design: architecture, city-planning, industrial design, interior and theatrical design, textile and fashion design, graphic design, garden and landscape design, crafts and decorative arts. The Museum is a leading international center for the study and interpretive display of the arts of design. For FY 1989, an increase of 1 workyear and \$89,000 is requested for: an assistant curator of drawings and prints (1 workyear and \$35,000); collections management, data entry services (\$30,000); and the Columbus Quincentenary (\$24,000). Necessary pay of \$15,000 is required for existing staff.

PROGRAM - The Cooper-Hewitt Museum was founded in 1897 as a working resource, a visual index to the history of the design arts for the use of both students and professional designers. Unlike most traditional art museums, which collected and displayed objects according to hierarchical aesthetic values, the Cooper-Hewitt has consistently used its collections as sources of information about the nature and importance of the design process for the benefit of those who are directly engaged in that process and for the public who are touched by it daily in countless ways. The Cooper-Hewitt's approach to collecting, exhibitions, publications, and educational programs has been highly unusual among American museums. The impact of its work has been significant not only in terms of increased understanding of the design arts among the general public, but also among leading architects and designers around the world. Inventoried permanent collections number in excess of 167,000 items and include drawings and prints, wall-coverings, textiles, ceramics, glass, metalwork, jewelry and decorative arts produced by European, Asian, and other cultures over a span of 3,000 years. The Museum's specialized library of 50,000 volumes, including 5,000 rare books, is closely related in its subject matter to the objects-collections and comprises a unique resource for scholars and designers alike.

The Cooper-Hewitt has been a bureau of the Smithsonian Institution since 1967. It now occupies a 1902 historic mansion built as the private residence of Andrew Carnegie as well as a smaller, neighboring townhouse, both of which were given to the Smithsonian in 1972 by the Carnegie Corporation as a permanent home for the Museum and its collections.

Federal appropriations for the Cooper-Hewitt have helped to support basic maintenance and security expenses while an overwhelming share of program expenses (exhibitions, publications, and educational activities) have been funded privately with a combination of earned income, grants from individuals, corporations, foundations, and annual allotments of Smithsonian unrestricted Trust funds.

Collections Management - Collections management activities are basic, wide ranging, and never ending responsibilities for any museum. At the Cooper-Hewitt, they include: growth of the collections (principally through gifts and only rarely with Trust funded purchases); selective refinement of existing collections through carefully managed deaccessioning; creation and subsequent management of accurate catalogue records for newly acquired items, and the continuous upgrading of old records on collection objects; reinventory of the entire permanent collection on a seven-year cycle; storage of collection objects not on exhibition; and, physical processing of all loans into and out of the Museum, including associated record keeping.

The scope of this work is suggested by the 775 acquisitions and more than 1,600 loan transactions handled by the registrar during the first three quarters of FY 1987. In addition, relocation of collection storage areas and the cyclical reinventory required the attention of the registrarial staff. The Museum's Textile and Paper Conservation Laboratories treated nearly 700 objects during the same period, many of which were selected for treatment in the process of preparing one or more future exhibitions.

Important progress in collections management was made during FY 1987 in the vital area of collections related information management. Computer work stations were established in the Registrar's Office and the Department of Decorative Arts, with plans for future installations in the Departments of Drawings and Prints and Textiles.

Programs have been designed for loan management and basic cataloguing functions and will be expanded and refined in years to come, to include linkage to related, Washington based systems as a long-term goal.

Acquisitions - In FY 1987, with the assistance of the Trust funded Collections Acquisitions Program, the Museum purchased a 13th-century needleworked figure of a Bodhisattva which is believed to have originated in China and was incorporated (probably in the 17th or 18th century) as part of a Buddhist temple banner. This remarkable textile decoration joins other extremely rare Oriental textiles in the permanent collection.

Another major acquisition for FY 1987 was the gift of 46 objects, most in pristine condition, from Barry Friedman and Patricia Pastor, which is the nucleus of a growing industrial design collection. Particularly interesting specimens in this generous gift include the German "people's radio," which was the ubiquitous household receiver for the propaganda broadcasts of Germany's Third Reich, and Ettore Sottsass's "Valentine" typewriter (c. 1969) for the Olivetti company.

Education - The Cooper-Hewitt/Parsons-New School Graduate Study Program in the History of the Decorative Arts is the only formal academic degree granting program currently offered under the auspices of the Smithsonian Institution. Each year since 1982, a group of 15 to 20 students has enrolled for a two-year period of class work, field trips, and independent study in various areas of the history of design and decorative arts. Accredited by the New York State Board of Regents, the Program awards an M.A. degree upon acceptance of a satisfactory thesis and has already become a valuable educational resource for professionals in museum curatorial and related fields.

Subscription programs are offered to the Museum's membership community and the general public in four quarters of special classes, workshops, symposia, tours and special events every year. In FY 1987, more than 5,700 persons explored topics as diverse as the architecture of ancient Greece and of great American cities, 17th- and 18th-century French decorative arts, the work of pioneering industrial designers of the 20th 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 twelve-meter yacht, and the graphic design of contemporary comic books.

Publications - Cooper-Hewitt publications are financed exclusively by private funds which represent the earnings generated by previous publications, gifts, and grants from special project sponsors. In addition to several long-term projects, there are continuing series of publications devoted to the design of immovable objects (i.e., not suitable for museum exhibitions by virtue of their nature and size) and modest but informative handbooks on selected groups of permanent collection materials.

Exhibition related publications included an English-German language volume with essays by four German scholars published to accompany "Berlin 1900-1933: Architecture and Design." A similar volume, generated by the exhibition "The Catalan Spirit: Gaudi and His Contemporaries," will feature essays by three American scholars and a Spanish colleague. Both publications have been supported, in part, by a prior-year grant from the J.M. Kaplan Fund, Inc.

Future publishing plans include substantial catalogues projected for important exhibitions devoted to the late 17th-century William and Mary style in Holland, England, and America, and to the design of maps, among other subjects.

Exhibitions - Undoubtedly, most people are aware of the Cooper-Hewitt because of the active and diverse program of changing exhibitions which attract both popular attention and critical acclaim. Working with approximately 11,000 square feet of gallery space, the Museum's exhibitions staff presents roughly 12 to 16 different exhibitions in four "seasons" each calendar year. The majority of these projects have been generated by the Museum for itself or in collaboration with other interested institutions; some are organized by the Smithsonian Institution Traveling Exhibition Service (SITES), and augmented by the Cooper-Hewitt for their New York showing; others come from outside organizations. For FY 1987, the Museum had 151,979 visitors and \$213,070 in gross receipts.

Cooper-Hewitt's own exhibitions during FY 1987 included the innovative and highly popular "Milestones: Fifty Years of Goods and Services" which marked the 50th anniversary of the American Consumers Reports Foundation and two samplings of the Museum's permanent collections to celebrate the Museum's tenth season in the Andrew Carnegie Mansion: "Perspectives: The Illusion of Space" in architectural prints, drawings, and publications, and "Recollections: A Decade of Collecting." Small exhibitions devoted to other aspects of the permanent collections also organized in FY 1987 included "Folding Fans," a fascinating look at over 100 examples of surprisingly seductive, intensely designed objects from Europe and the Orient; "Safe and Secure: Keys and Locks" from ancient to high-tech times; and "Crystal Palaces," a photographic survey which was suggested by the recent discovery of a volume of extremely fine and very rare photographs of London's original 1851 "Crystal Palace," in the Museum Library's rare book room. Major exhibitions were also organized by the Museum on the subjects of modern architecture and design in Berlin and Barcelona, both of which proved very popular with the critics, members and the general public.

Two other important architecture exhibitions also found places in the FY 1987 schedule. These were organized by outside groups and edited by Cooper-Hewitt staff for presentation in New York. "Louis Sullivan: The Function of Ornament" and "Frank Lloyd Wright and the Johnson Wax Buildings: Creating a Corporate Cathedral," represented the work of two of America's most important modern architectural thinkers and builders.

In FY 1988, the Museum's exhibition program included designs of printed fabrics before 1860, "pop-up" books, corporate annual reports, and celebratory arches, among other subjects. With the assistance of outside curatorial consultants, the Museum also examined the work of the 20th-century architect Joseph Urban, and the rich traditions of Swedish silversmithing from the 17th century to the present. Also, the Museum is showcasing a superb group of 18th-century architectural drawings from Swedish national collections which relate to Versailles and illustrate the importance of French taste in Sweden during the fabled reign of the Sun King, Louis XIV.

FY 1989 brings the Tercentenary of the "Glorious Revolution," through which William of Orange and Mary Stuart were brought to the throne of England's deposed King James II. That event was of major significance for the evolution of constitutional government in Britain and her colonies, and to mark it appropriately, Cooper-Hewitt and the Carnegie Museum of Art in Pittsburgh are co-organizing "Courts and Colonies: The William and Mary Style in Holland, England, and America." The exhibition is

being assembled by an international team of curatorial scholars and will be seen in both New York and Pittsburgh.

Other projects in various stages of planning include: hiding as a design motive; early 20th-century architecture and design in central Europe; designs related to death; and possibly two very different kinds of design survey as contributions to the Columbus Quincentenary celebrations in 1992. Also, a major exhibition will be developed for FY 1989 which will be devoted to the arts design in France since the French Revolution.

Capital Campaign Fundraising - The retirement of the director of the Cooper-Hewitt Museum in mid-1987 prompted suspension of active fund-raising until a successor is named. On June 26, 1987, Mary Rose Oakar introduced H.R. 2815, a bill to authorize appropriations up to \$15 million, an amount which must be matched with privately raised funds. The bill was co-introduced by Messrs. Boland, Conte, Mineta, and Frenzel. A companion measure, S. 1749, was introduced by Senator Moynihan on October 2, 1987.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 1 workyear and \$89,000 is requested for: an assistant curator of drawings and prints (1 workyear and \$35,000); collections management, data entry services (\$30,000); and the Columbus Quincentenary Program (\$24,000).

Assistant Curator of Drawings and Prints (1 workyear and \$35,000) - In FY 1989, an increase of 1 workyear and \$35,000 is requested for salary costs to establish a second permanent full-time curatorial position in the Department of Drawings and Prints. This position is necessary to provide professional services in demand by the public, undertake research on the collections, and insure the proper care and maintenance of the collections. At present, one curator and two museum technicians are responsible for over 113,000 objects (the Museum's total inventory is over 167,000 objects) in the drawings and print collection which range from 17th- and 18th-century Italian drawings and French prints to 19th-century American art by masters such as Homer, Church and Moran. In comparison, the Smithsonian's National Museum of American Art has a graphics collection of approximately 20,000 objects, devoted solely to American prints, drawings and photographs, three full-time curators, and support personnel.

Although only a small fraction of the permanent collection may be on exhibition anywhere at a given time, this is a world-renowned working collection. There is a high volume of inquiries, from scholars, the design community, and the general public, which requires the expertise and knowledge of another curator devoted to the collections. In addition, a curator must conceive, research, and produce exhibitions based on the collections; review and approve loan requests; catalogue collection objects; identify objects for acquisition and deaccessioning; and produce catalogues, books and essays based upon original research. Despite the energy and devotion of the current curator, the considerable scope of responsibility has resulted in cataloguing backlogs including a widespread need for more thorough information to incorporate the findings of recent scholarship with existing records.

It is critical that the Museum add another professionally trained curator to the staff so that more than just basic maintenance and minimal scholarship (in the form of exhibitions and publications) can be done with the collections. If funding for this curatorial position is not approved, the Museum will continue to suffer indefinite delays in the cataloguing and publishing of existing holdings.

Collection Management Data Entry (\$30,000) - In FY 1989, an increase of \$30,000 is requested, above a base of \$25,000, for the purchase of commercial data entry services to support the Museum's systematic efforts to modernize its record keeping and management systems for collection based data.

An automation plan prepared by the Museum establishes the framework for the current and future use of hardware and for coordinated development of programs and resources in keeping with sound management principles. This plan will also assure compatibility with Institutional planning and implementation of similar systems in the Washington based bureaus. The Collections Reference System and related collections management applications have been principal elements of the Cooper-Hewitt plan from its inception. By FY 1989, the capability to initiate the transfer of data from existing records and to receive original data on collection objects as they are acquired into an automated database will be in place. What is needed, however, is the capacity to execute the extensive data-entry workload. Curators and technicians will be generating and reviewing data, but they cannot possibly transfer the necessary information on more than 167,000 objects without adequate support. For the first year, the increase of \$30,000 will purchase approximately 2,000 hours of such support annually from commercial word-processing and keypunch agencies at \$15-\$20 per hour, which is the projected cost of such services for the New York City area in FY 1989.

Until the transfer process actually begins, it is difficult to project its pace and duration, but the Museum's other data-entry requirements for current cataloguing and related collection management applications will certainly be a permanent need and very likely a growing one. Without funds to pay for such work, the Museum will be unable to take advantage of the technology it has been developing and will be forced to continue to defer a solution to its collection information problems (which will therefore grow larger with each passing year). In order to achieve even piecemeal progress in this program, existing staff would have to curtail their professional activities in one or more areas.

Columbus Quincentenary Program (\$24,000) - For FY 1989, an increase of \$24,000 is requested to permit the Cooper-Hewitt Museum to begin a Quincentennial project to conduct a survey of the ways and means by which Native American arts have inspired and affected the architecture and design arts of Western Europe and North America from the 16th century to the present.

One research assistant, under the guidance of the curator of the Decorative Arts Department, will explore the continuing appeal exerted by the ceramics, textiles, metalwork and architecture of Native American cultures of the western hemisphere for mainstream architects and designers of Europe and North America, with particular attention to the 19th and 20th centuries. Such an exhibition would be an unprecedented opportunity to discover important relationships and influences between elegant pottery traditions of South America and English 19th-century art pottery, metalwork from Central American cultures and the New York City Studio of Louis Comfort Tiffany, and the architectural forms of pre-Columbian sites and the innovations of Frank Lloyd Wright, among others.

This project has unusual scope and will involve a variety of cultural traditions. It will also involve joint research with domestic and foreign academic and museum enterprises, a direction the Secretary encourages the Smithsonian to pursue for FY 1989. Contractual consultation by one or more outside experts will be required for a period of three years.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from a variety of sources including museum shop sales, product development, membership and admissions fees, donations, fund-raising events, and allotments. The allotments support salaries of the director, administrative officer, and various staff members and help defray expenses associated with special events such as exhibition openings. Special Purpose Funds are used to support educational programs, exhibitions and publications for the Museum. In FY 1987, Collections Acquisition and Special Exhibition grants made possible the purchase of the Bodhisattva figure and provided almost one-half of the funding required for "Courts and Colonies." Expenditures under these programs have not been recorded for FY 1988 and FY 1989 which explains the variance in totals shown between FY 1987 and the two subsequent years.

Restricted Funds - These funds are provided for specific purposes from grants, bequests, and other donations from individuals, organizations, and corporations. In FY 1988 and FY 1989, these funds will support exhibitions such as "Courts and Colonies: The William and Mary Style in Holland, England, and America," the survey of French design arts since the Revolution, and assorted smaller projects. For FY 1988, the Museum has received a \$200,000 challenge grant from the Andrew W. Mellon Foundation to stimulate future fundraising to a \$600,000 endowment to support scholarly research and publication projects. The Mellon gift will be available in increments as matching gifts are generated over a period of three years.

Government Grants and Contracts - These funds are provided by various government agencies and departments for specific program support. The Museum annually seeks funding in varying amounts from the New York State Council on the Arts for exhibition support and other programs. Requests for seven separate projects were submitted for possible funding in FY 1988.

NATIONAL MUSEUM OF AFRICAN ART

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	44	3,025	2	134	3	1,348	-	65	-	-
FY 1988 -Estimate	55	3,385	2	74	3	265	-	313	-	-
-Base	55	3,411								
FY 1989 Estimate	58	3,535	1	47	3	232	-	595	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	55	3	58
11 Personnel Compensation.....	1,462	80	1,542
12 Personnel Benefits.....	212	24	236
21 Travel.....	45	-	45
22 Transportation of Things.....	94	-	94
23 Rent, Communications & Utilities.....	3	-	3
24 Printing & Reproduction.....	137	-	137
25 Other Services.....	842	8	850
26 Supplies & Materials.....	417	5	422
31 Equipment.....	69	7	76
Collections Acquisition.....	130	-	130
Total	<u>3,411</u>	<u>124</u>	<u>3,535</u>

Analysis of Increase

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ABSTRACT - The National Museum of African Art is the only museum in the United States devoted to the collection, preservation, research, exhibition, and interpretation of the visual arts of Africa. Founded in 1964 as a private non-profit institution, the Museum became a bureau of the Smithsonian Institution in August 1979 following the enactment of Public Law 95-414. In December 1986, the Museum moved from its original Capitol Hill location to its new facilities on the Mall as a part of the Quadrangle complex, which opened to the public in September 1987. For FY 1989, an

increase of 2 workyears and \$84,000 is requested to develop the Museum's ethnographic conservation capability, particularly the conservation of metalwork (1 workyear and \$44,000); and to further the development of the Eliot Elisofon Photographic Archive (1 workyear and \$40,000). Necessary pay of \$28,000 is required for existing staff, along with 0.5 workyear and \$12,000 required to annualize the partial-year funding of 2 new positions approved in the FY 1988 budget.

PROGRAM - The NMAfA endeavors to instill an appreciation and understanding of the diverse cultures in Africa south of the Sahara. Although the Museum's primary emphasis is on the traditional cultures of the sub-Saharan region, it also studies and exhibits the ancient and contemporary arts of the entire continent. The Museum develops and presents a variety of interpretive programs including exhibitions, lectures, gallery tours, classes, workshops, audio-visual presentations, and publications. Each program endeavor is motivated by the esthetics of traditional African art, and the Museum actively cooperates and coordinates its activities with those organizations and institutions whose purposes are complementary.

Funding provided in FY 1985 through FY 1988 will enable the Museum to continue to strengthen its staff and support the expanded exhibition, research, acquisition and education programs developed for its new Mall facilities.

Research - The continuation of the program of scholarly publications and exhibitions, begun by the Museum for its inaugural exhibitions in the new facility in 1987, is an important aspect of ongoing research and public education. With funding provided in FY 1988, the Museum will hire an assistant curator for Central African art. The addition of this position will provide curatorial specialization for the major sub-Saharan geographic/cultural regions--West, Central, and Southern/Eastern--that are represented in the Museum's collections.

Current projects leading toward future exhibitions and/or publications include research on the arts of the East African coast including those of the Swahili-speaking peoples; continued research on the arts and architecture of Nomads, which was also the topic of a conference held in early FY 1988; research on a corpus of cast copper-alloy sculptures from southern Nigeria, the so-called 'Lower Niger Bronzes'; and a working symposium on the arts of the Luba complex, a large and important group of peoples in eastern Zaire.

In addition, a catalogue is planned to accompany the exhibition of African pottery being researched and planned by the Museum's curatorial department. The variety of ceramics from sub-Saharan Africa will be surveyed according to utilitarian or ritual uses, types of objects, and styles. Since pottery is most often made by women, this exhibition and catalogue will be an important work concerning the contribution of women to the artistic heritage of Africa.

Since FY 1986, the Museum has awarded post-doctoral residence fellowships. This residence fellowship program in the humanities, administered by the Smithsonian's Office of Fellowships and Grants, was made possible by a grant from the Rockefeller Foundation. Enhancement of the Museum's fellowship and internship program continues; in FY 1988, the third fellow in residence, Dr. Herbert Cole, University of California, Santa Barbara, will conduct research on "Archetypes of African Sculpture." This topic is a continuation of a series of studies and small exhibitions he has undertaken in California. He will bring the several themes of this topic, including the primordial couple, woman and child, the powerful male figure, and the equestrian figure, all of

which appear frequently in the sculpture of sub-Saharan Africa but have never been drawn together for study or exhibition into a single focus.

To foster international cooperation and exchange, planning will begin in FY 1988, for a major gathering of African art scholars in the spring of 1989. The African Art Triennial has taken place every three years since 1968, and it is the most important conference of African art specialists, bringing together leading American, European and African scholars.

The Eliot Elisofon Archives, a major research component of the National Museum of African Art, is one of the largest archives in existence on African art, culture and environment. Its holdings number nearly 150,000 color slides, over 70,000 black and white photographs, 120,000 feet of unedited film footage and 50 feature films. Noteworthy among the Archive's recent acquisitions are 166 duplicate color slides from Veronique Vanomilier's fieldwork among the Luba people in Zaire.

In FY 1987, the staff of the archives responded to an extraordinary volume of staff requests for slides and prints needed for the intensive research conducted for the inaugural exhibitions. Although closed to the public during the move, duplicates of slides and prints were also provided in response to requests from students, scholars, universities, museums and other organizations.

The National Museum of African Art Branch of the Smithsonian Institution Libraries (SIL) system, as one of the major African art library collections in the world, provides bibliographic reference and research support not only for the staff of the Museum but for national and international scholars, including those from Africa. As a result of a major multi-year acquisition program, the library collections reached a projected level of 15,000 volumes and approximately 300 periodical titles in FY 1987. The Library expects to continue to develop its collection to serve the expanded research needs of the Museum. The Library continues an active outreach program through the publication and distribution (free of charge) of the monthly Library Acquisitions List now distributed to about 400 individuals and institutions worldwide.

Exhibitions - The Museum presented five inaugural exhibitions for the public opening of its new facilities in September 1987. "Patterns of Life: West African Strip-Weaving Traditions" traced the stylistic and technical development of this West African weaving tradition. "African Art in the Cycle of Life" illustrated the role of the arts in traditional African life. "The Permanent Collections of the National Museum of African Art" highlighted some of the more recent acquisitions of the Museum, many of which have never before been exhibited. "Royal Benin Art in the Collection of the National Museum of African Art" featured 22 bronze objects from the ancient kingdom of Benin (Nigeria). "Objects of Use" illustrated artists' creative use of materials and economy of means in nonfigurative utilitarian objects.

With the opening of these five inaugural exhibitions on September 28, 1987, the Museum initiated an expanded exhibition schedule for its new facilities. Funding provided in FY 1988 established an expanded base for the projected costs of the special handling and shipping requirements necessary for the international shipment of art objects for the major loan exhibitions planned for the future.

Temporary exhibitions proposed for FY 1988 include a major loan exhibition of ancestral screens of the Ijo of the Niger Delta, with accompanying catalogue, produced in collaboration with The British Museum; "Images from Bamum: German Colonial

Photography at the Court of King Njoya, Cameroon, West Africa, 1902-1915," organized by the NMAfA; and "Shoowa Textiles," a major private European collection of textiles from south central Zaire, circulated by the University of Michigan Art Museum, Ann Arbor.

Planned for FY 1989 is "The Art of African Exploration," a selection of 34 handsomely illustrated 19th-century books recently acquired by the National Museum of African Art Branch of the Smithsonian Institution Libraries. Lithographs, aquatints and steel engravings illustrate these records of the experiences of explorers, missionaries, travelers and traders during the 19th century exploration of the African continent.

Also in FY 1989, the Museum plans to present "African Gold," a collection of precious objects assembled by the Barbier Mueller Museum, Geneva, Switzerland, and circulated in the United States by the American Federation of Arts; "The Essential Gourd: Art and History in Northern Nigeria," organized by the Museum of Cultural History, University of California; and "African Musical Instruments," organized and circulated by the American Federation of Arts.

Education and Public Orientation - The National Museum of African Art develops and presents programs for a broad and varied public audience, both within and outside the Museum, to promote increased public awareness and understanding of African cultures. Interpretive programs such as lectures, films, gallery talks, tours and workshops supplement information provided by exhibitions and offer a range of opportunities and incentives for learning about Africa and its artistic heritage. A computerized system will be put into effect in FY 1988, enabling the department to schedule a greater number of programs to keep pace with anticipated increased program requests.

During the period that the Museum was closed to the general public in FY 1987, more than 200 outreach programs were scheduled and presented to schools, hospitals and senior audiences, reaching over 10,000 participants. During FY 1988, outreach programs will continue to be offered to make the resources of the Museum available to groups who cannot come to the Mall.

In July 1987, the Department of Education and Research, in conjunction with the Office of Elementary and Secondary Education, offered a course for K-12 teachers titled "African Art in the Classroom." It was attended by more than 20 teachers. A new series of Teacher Workshops to be offered in FY 1988 will enable teachers of all grades to integrate museum tours and other programs into their curricula. Topics for scheduled Teacher Workshops include current exhibitions as well as more general subjects such as "The Social Context of African Art."

As part of the inaugural activities in conjunction with the opening of the Museum's new facilities, a symposium on "The State of the Discipline of African Art Studies" was held on September 16, 1987, with attendance by more than 500 persons. In FY 1988, a symposium on "Design and Color Symbolism in West African Strip Woven Cloth" will be presented. Papers from both symposia will be published during FY 1988.

To widen the impact of its educational and museum outreach programs, the Museum also sponsors academic courses in African art in conjunction with other Smithsonian programs and outside institutions. In FY 1988, courses will be offered through the Smithsonian Resident Associate Program and through Georgetown University's undergraduate program and its School for Summer and Continuing Education.

The Museum's docent training program ensures that knowledgeable volunteer guides are available to conduct tours and other Museum programs. To strengthen visitor experiences, 30 docents were trained in FY 1987 to present outreach programs and 25 docents were recruited and trained to present weekday tours.

During FY 1987, the Museum's Public Affairs Office distributed complete background information about the Museum's inaugural exhibitions and programs to local, national and international press. A general Museum brochure was produced as well as a calendar of events that will be mailed quarterly to the Museum's mailing list of over 10,000 names.

Collections Management - During FY 1987, the Collections Management staff developed and implemented a thorough, well-documented plan to move the permanent collection of over 6,000 objects to the Museum's new facility. Computerized inventory records were refined; a flexible, ongoing inventory control system was devised to ensure specific object locations during and after the move; packing and handling specifications were developed to ensure the safety of the objects; and after the move was completed, equally careful attention was paid to unpacking and storage organization. Each object was placed in its pre-designated permanent storage location and the computerized inventory/location files were verified and updated.

For the first time in the Museum's history, a photographer is now on staff to record systematically the collection holdings. This work is essential to collections management and there is a severe backlog that can now be addressed. The photographic studio, which began operations in April 1987, processed 120 photographs of primary works of art in the collection during its first three months.

The Museum has, in its new facility, a state-of-the-art conservation lab for the care and treatment of ethnographic art. With equipment such as a central vacuum system, an X-radiography unit, a stereo microscope, and polarizing light microscope with reflected and transmitted light capacities for material analyses and objects treatment, the Museum was able, in FY 1987, not only to begin systematically to treat its collections, but also to establish programs that offer laboratory experience for undergraduate and post-graduate conservation students. Throughout FY 1987, the staff of the conservation department examined all objects to be included in the inaugural exhibitions. In addition, procedures were established for complete conservation care of the Museum's varied collections and conservation treatment needs were ranked in priority order.

Development of Collections - The Museum continued to work steadily to acquire objects of the finest aesthetic quality to strengthen its holdings. An active acquisitions program, through both gifts and purchases, remains one of the Museum's highest priorities and must continue to be to support the Museum's expanding research, exhibitions and public programs.

Particularly noteworthy gifts include a collection of 13 objects from various sub-Saharan regions--notably seven masquettes from the Sisala people of Burkina Faso and an Asante ladle from Ghana. In addition, the collection was enriched through gifts of a Fang reliquary guardian head from Gabon, two Kente textiles from Ghana, a Somali headrest, a Chokwe mask and a pipe from the Cameroon. Through purchase, the Museum acquired a superb example of a fired clay vessel from Malawi as well as a headdress and a terracota figure, both from the Igbo peoples, Nigeria. A grant from the James Smithson Society supplemented Federal funds to make possible the acquisition

of a figure from the Asante people of Ghana believed to ensure human fertility and the health and beauty of a child. This rare work is a complex double image carved from a single block of wood and one of no more than a half dozen carvings of this particular type.

Automation - The Museum began to develop an automation capability with funding provided in FY 1986 and FY 1987. To date, the Museum has acquired 24 workstations, with necessary software, and has provided for staff training, the use of the central computer system and equipment maintenance. Funding provided in FY 1988 will provide an expanded base of \$90,000 to purchase additional hardware and software for the design and collections management department and will permit the establishment of a cyclical replacement program for automation equipment. A new position for a computer specialist, also provided in FY 1988, will assist in the development of automation systems for research, public information, education and publication programs, and to provide more efficient administrative support in financial management, procurement and personnel services.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 2 workyears and \$84,000 is requested to develop the Museum's ethnographic conservation capability, particularly the conservation of metalwork (1 workyear and \$44,000); and to further the development of the Eliot Elisofon Photographic Archives (1 workyear and \$40,000).

Conservation and Scientific Testing (1 workyear and \$44,000) - Before moving to its new facilities in the Quadrangle, the National Museum of African Art did not have space or sufficient equipment for a conservation laboratory. As a consequence, there is a severe backlog of material to be treated as well as a need to continuously monitor the objects in the permanent collection. A large proportion (approximately 1,000 objects) of the permanent collection are metal objects that require both treatment and analysis. Without additional support for this aspect of the Museum's conservation program, existing deleterious chemical conditions will continue to damage significant segments of the collection.

For FY 1989, the addition of an assistant conservator (1 workyear and \$29,000) to the current staff of two (consisting of a chief conservator and an assistant) is requested to ensure adequate staff to carry out scientifically established treatment procedures. This additional conservator will ensure that systematic treatment of the entire permanent collection proceeds at a reasonable pace, as well as allow the Museum to conduct the required conservation work on loan objects to prepare them for exhibition. Even with the addition of this third position, it is anticipated that it will take at least two to four years just to stabilize the collections, before further conservation work and analysis can begin. With a staff of only two, it would take proportionately longer to stabilize the collections, further jeopardizing the condition of the objects.

While the new conservation laboratory is exceptionally well equipped, and spot testing to determine the qualitative composition of metals can be done, the lab does not have the equipment to mount samples for microscopic analysis. A sum of \$7,000 is requested to purchase specialized equipment, such as a Beuhler mounting press and grinding wheels, for use in the mounting of samples. This equipment is also required to conduct analyses for a proposed co-organized exhibition with the British Museum on a corpus of Nigerian metalwork, a recently identified metallurgical tradition in which very little research has been conducted, and to carry out systematic research on the Museum's 21 cast copper-alloy Benin (Nigeria) objects.

Since metallography is a highly complex specialty, a project of this magnitude requires consultation with an expert in this field during the initial planning phase and, after the technical work has been completed, for specific interpretation of the results of the sampling. A sum of \$8,000 is requested to contract with outside conservation experts who have specialized knowledge to conduct these analyses.

This funding will be used in future years to contract for specialized conservation services in metallography and other fields, and for ongoing requirements for specialized supplies and equipment. Additional funding to begin the publication of a conservation bulletin is anticipated to be requested in FY 1992.

Development of Photographic Archives (1 workyear and \$40,000) - The Eliot Elisofon Photographic Archives in the National Museum of African Art is one of the largest archives in existence on African art, culture and environment. Its holdings now number 150,000 color slides and 70,000 black and white photographs, as well as 120,000 feet of unedited film footage and 50 feature films.

While there are many small photographic archives in existence, their focus, unlike that of the Museum, is extremely narrow. For this reason, the Museum's archival holdings are constantly in demand by scholars throughout the world as well as by staff in support of the Museum's exhibitions, education, and curatorial research programs. Further, many United States and European researchers in anthropology and the fine arts have expressed the need for a central repository for their field photographs and slides, and their hope that the National Museum of African Art will fully assume this important role. Given the importance of this research resource, the Museum must systematically move the development of the Archive forward. Present indexing capability must be strengthened and revised and a comprehensive catalogue developed which can provide the kind of conceptual framework that scholars expect.

Currently, base funding of \$57,000 provides for a staff of two (consisting of an archivist and an assistant) and necessary support costs for the department. For FY 1989, an increase of 1 workyear and \$40,000 is requested to further the development of the Archives as one of the most important pictorial resources in the United States. The requested increase will allow the Museum to hire an archivist (1 workyear and \$35,000) with specialized knowledge in the art history of Africa. A major responsibility of this position will be to develop and establish catalogue procedures for the archival collections, based on the unique context of African art history. Without this requested position, the Archives cannot be effectively accessed as a research resource. This means that incoming acquisitions as well as the current substantial holdings can serve only limited scholarly or public use.

As the Archives grows during the next five year period, the Museum must also consider how technology can begin to further research and increase its effectiveness. It is expected that the new archivist position will also provide the leadership necessary to move the Archives in this advanced technological direction. A sum of \$5,000 is also requested for additional archival supplies and materials. This funding will be retained in FY 1990 and following years.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from the Museum's share of sales in the museum shop, courses conducted in cooperation with

Washington metropolitan area public education institutions, and allotments. They are used to provide additional support for the Museum's education and collections acquisition programs, exhibition openings, and travel costs associated with meetings of the Museum's Commission. In FY 1988, allotments will be provided to support the salary costs of one employee.

Restricted Funds - These funds are contributed for special purposes in the form of grants and gifts from individuals, foundations, organizations or corporations for specific purposes. A grant from the Shell Companies Foundation in FY 1987 provided funds for the Museum's educational and scholarly programs, and subsequent grants are anticipated for FY 1988 and FY 1989. A grant for a planning conference was given by The Rockefeller Foundation in preparation for a future exhibition on nomadic art and architecture. A generous anonymous contribution made possible the designation of the Museum's library as the Warren M. Robbins Library. In FY 1988, a grant was received from the Annie Laurie Aitken Charitable Trust which was used to establish a collections acquisition endowment fund.

Two grants received from the Women's Committee of the Smithsonian National Associate Program will enable the Museum to publish the symposium papers, "African Art History: the State of the Discipline" and will provide speakers' honoraria for the symposium "Design and Color Symbolism in West African Strip Woven Cloth."

The Museum will continue to seek additional funds from private sources to strengthen its permanent collection.

ANACOSTIA MUSEUM

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	14	868	1	37	-	2	-	-	-	-
FY 1988 -Estimate	19	929	1	44	-	-	-	-	-	-
-Base	19	938								
FY 1989 Estimate	21	1,016	1	44	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	19	2	21
11 Personnel Compensation.....	487	47	534
12 Personnel Benefits.....	81	14	95
21 Travel.....	4	1	5
22 Transportation of Things.....	5	-	5
23 Rent, Communications & Utilities.....	6	-	6
24 Printing & Reproduction.....	68	1	69
25 Other Services.....	111	4	115
26 Supplies & Materials.....	157	4	161
31 Equipment.....	19	7	26
Total	938	78	1,016

Analysis of Increase

Necessary Pay.....	8
Program Funds.....	70

ABSTRACT - The Anacostia Museum, which is located in the southeast section of Washington, D.C. (approximately six miles from the Mall), serves as a national resource for exhibitions, scholarly and applied research, historical documentation, and interpretive and educational programs relating to black history and culture in America. Founded in 1967, the Museum celebrated its 20th anniversary in 1987. For FY 1989, an increase of 2 workyears and \$70,000 is requested to strengthen and expand the Museum's research support by hiring a registrar and a librarian. Necessary pay of \$8,000 is required for existing staff.

PROGRAM - Presenting American history from a multi-ethnic perspective (with a focus on black contributions) through its research, exhibition and educational/interpretive activities, the Anacostia Museum is a national prototype for scholarly and applied research, historical documentation, exhibition, and interpretive and educational programs relating to the experiences of black Americans and their contributions to science, history and the arts. The Anacostia Museum works with other Smithsonian museums and programs in researching and exhibiting subjects related to black history and culture. Established as a cultural resource for the people of Anacostia, the Museum has developed into a museum on Afro-American history and culture, serving as a valuable source of materials on black American history for other museums and organizations and of innovative ways for introducing nontraditional museum audiences to the worlds of science, history, and the arts. The Museum is an active member in several professional museum associations, including the American Association of Museums and the African American Museums Association, and works with other museums and research institutions, universities, and archives throughout the United States to enhance the awareness and appreciation of the contributions of black history and culture to American society.

Research - In FY 1987, research continued in conjunction with the development of three exhibitions to be presented at the Museum in FY 1988 through FY 1989. Research on the vital role that the black church played in developing black communities, conducted by the Museum since FY 1984, culminated in the major exhibition, "Climbing Jacob's Ladder: The Rise of Black Churches in Eastern American Cities, 1740-1877." Anacostia research staff contacted and visited individual congregations and major repositories of church records in Savannah and Augusta, Georgia; Nashville and Jackson, Tennessee; Salisbury, Raleigh and Chapel Hill, North Carolina; Charleston, South Carolina; Philadelphia, Pennsylvania; New York, New York; Boston, Massachusetts; and Richmond, Virginia. This research project has attracted much enthusiastic support and interest from the academic and museum communities. A publication will complement the exhibition and make available new and significant research data compiled during this project to scholars in the fields of black history and church history.

Research on Prentice H. Polk (1898-1985), a photographer whose documentation of southern folklife extended for more than half-a-century, has resulted in bringing together, for the first time, a reservoir of varied knowledge about this consummate artist whose national recognition came during the last decade of his life. In FY 1988, the exhibit script will be developed and preparation of the accompanying exhibit catalogue will begin. The catalogue will include biographical data concerning P.H. Polk, a listing of all known Polk exhibits, and an expanded record of bibliographical data compiled during the research.

Also during FY 1987, research on black inventors continued, with the development of an exhibit script for "A Continuing Tradition: Afro-American Contributors to American Technology." The exhibit and accompanying catalogue will focus on black craftsmen's relationship to developing technology, innovative and inventive techniques they brought to their work, and the major social and cultural issues that formed the context within which they worked.

Exhibitions at the Museum - The new exhibition gallery at the Museum's Fort Stanton Park facility opened on May 17, 1987, with "Contemporary Visual Expressions" as the inaugural exhibition. Presenting the works of four contemporary black American artists: Sam Gilliam, Martha Jackson-Jarvis, Keith Morrison, (all of Washington, D.C.) and William T. Williams (from New York City), this exhibition was curated by famed art historian, Dr. David C. Driskell, professor of art at the

University of Maryland. "Contemporary Visual Expressions" interpreted the personal and collective aesthetics of these artists, whose work has been derived from African and Caribbean visual experiences, neoplasticism and color field painting, abstract expressionism, and African lore and religion.

"Climbing Jacob's Ladder: The Rise of Black Churches in Eastern American Cities, 1740-1877," which opened in October 1987, documents the importance of black churches in 18th- and 19th-century urban life through the presentation of artifacts and archival materials from active congregations and major repositories in eight states. Approximately 150 artifacts ranging in size from church pews to tiny hymn books are displayed, including: a pulpit belonging to Lott Carey, a Virginia slave who became an early 19th-century missionary to West Africa (from the First African Baptist Church of Richmond, Virginia); a reed organ of rare construction dating from 1864 (from the Bethel A.M.E. Church in Baltimore -- one of the oldest black congregations in America); and an extremely rare 19th-century hymn book (from the United Library of Garrett-Seabury Theological Seminaries at Evanston, Illinois), which was the first hymn book compiled by a black American (Rev. Richard Allen) and the first hymn book compiled specifically for a black congregation (the Mother Bethel Church in Philadelphia).

A second exhibition to be presented in FY 1988 will be "Inspiration: 1961-1988," scheduled to open in May 1988. "Inspiration" will feature a retrospective of works of art by approximately 35 members of the District of Columbia Art Association.

Artifacts, documents and manuscripts, photographs, and other visual images have been located for the exhibition, "A Continuing Tradition: Afro-American Contributions to American Technology," (scheduled to open in September 1988) and negotiations with lenders are under way for the loan of artifacts to be used in the exhibition. Several outstanding artifacts have been located, including an original patent model from the Cliff Petersen collection and two full-scale demonstration models of a stop light and a gas mask invented by one of the foremost black inventors, Garrett Morgan.

"P.H. Polk: The Man and His Work" (scheduled to open in June 1989) will feature Prentice Polk's photographic documentation of 20th-century southern folklife and include vintage and signed prints from the P.H. Polk estate, Tuskegee University Archives, private lenders, and galleries. Videotape excerpts of television interviews with Polk conducted by NBC, CBS, and Metromedia News will also be presented as part of the exhibit.

Traveling Exhibitions - The Anacostia Museum has produced several traveling exhibitions related to the history, culture, and achievements of black Americans, including "Out of Africa"; "The Frederick Douglass Years"; "Black Women: Achievements Against the Odds"; and "Mary McLeod Bethune and Roosevelt's Black Cabinet." These traveling exhibitions, circulated by the Museum and by the Smithsonian Institution Traveling Exhibition Service (SITES), allow the Museum to reach a diverse national audience. A recent brochure distributed by SITES, "Black History and Ethnic Studies Exhibitions from the Smithsonian Institution," highlights 16 SITES exhibitions currently available for travel, including "Black Women" and "Out of Africa," that are of particular interest to institutions looking for traveling exhibitions in these fields.

"Black Women: Achievements Against the Odds" profiles the lives, careers, and accomplishments of 200 black women, including Madame C.J. Walker (America's first black millionaire) and Edomonia Lewis (one of the first black female American artists

to gain international recognition). "Out of Africa" documents the early chapters of black history, including the slave trade from Africa, slave life in the American colonies, and the abolition movement. During FY 1987, "Black Women" was exhibited at five locations, including Pennsylvania State University in University Park, Pennsylvania; Parthenon Galleries in Nashville, Tennessee; and the New York State Fair in Syracuse, New York. "Out of Africa" was also exhibited at five locations including presentations by the Hawaii Committee for the Humanities, in Honolulu, Hawaii; Tupelo Art Gallery in Tupelo, Mississippi; and the California Museum of Afro-American History and Culture in Los Angeles, California.

The paper panel exhibition based on the "Black Women" traveling exhibition has become one of SITES' most popular paper panel shows. These shows, which are offered for sale for \$200, summarize material presented in the larger exhibitions and combine illustrations, photographs, and text printed on heavy poster paper. Their flexibility, durability and low cost allow small museums and other organizations to make these exhibitions available to diverse audiences throughout the United States.

Public Education and Orientation - During FY 1987, the Museum conducted a workshop on Kwanza and a Black History Month Planning Clinic. "The Renaissance: Black Arts of the Twenties" exhibit was highlighted by a vintage film series; a demonstration by Georgette Seabrooke Powell, a well-known WPA artist, who talked about the renaissance artists she knew; gallery talks on visual artists of the twenties; and poetry readings of work by Sterling A. Brown, a poet laureate, author, and educator. During the month of December 1986, storyhours, African drumming and dancing, films, and a Lunch Bag Forum in which Richard Powell, a predoctoral fellow at the National Museum of American Art, spoke on renaissance painter William H. Johnson, highlighted the final days of "The Renaissance" exhibition. ("The Renaissance" exhibition was the last exhibition to be presented at the Museum's location in the Carver Theater building, which was closed at the end of 1986.)

Following the opening of the new exhibition gallery at the Fort Stanton Park facility, the Museum continued the Lunch Bag Forum series with talks by artists Sam Gilliam and Keith Morrison, whose works were on display in the "Contemporary Visual Expressions" exhibit. A "Meet the Artist" series brought five local artists to the museum for demonstrations and informal talks, and a Creative Arts Workshop drew young people to early morning classes.

On June 14, 1987, over 400 people from the Washington metropolitan area attended a community "Family Day" program at the Museum. This program, supported by a grant from the Smithsonian Institution Women's Committee, was intended to introduce the Museum to Washington area residents who had not previously been familiar with its programs.

During the Fall of 1987, public programs sponsored in conjunction with the "Climbing Jacob's Ladder" exhibition included a dramatic presentation on the "Life and Times of Richard Allen," documenting the story of Rev. Richard Allen, the former slave who rose to become the founder and first bishop of the African Methodist Episcopal Church, and a lecture/concert on early black church music. Lunch Bag Forum programs related to the exhibition included a slide lecture by Richard Powell, director of programs at the Washington Project for the Arts, on "Religion and Afro-American Art," and a lecture by Dr. Clarence G. Newsome, assistant dean of Howard University School of Divinity, on "A Parting of the Way: The Conservative/Progressive Controversy and the Post-Bellum Black Church."

Community Relations: As part of the Museum's effort to introduce its programs and activities to its new community and to strengthen existing relationships, Anacostia Museum staff conducted on-site visits or conferences with the property manager and residents of the Woodland Terrace housing development; Roving Leaders staff members; Allen A.M.E. Outreach Program; Stanton Road and Alabama Avenue public libraries; and the museum liaisons at Our Lady of Perpetual Help and Savoy Elementary Schools. Additionally, presentations about the Museum were made at a joint meeting of the Moten-Johnson-Wilkinson faculty meeting and the Johnson Junior High School Far Southeast Career Center. On the citywide level, Museum staff spoke at a departmental meeting of social studies teachers on "How to Use the Resources of the Anacostia Museum," sponsored a citywide seminar for social studies teachers and community residents on the black church, and developed a community seminar on the "Climbing Jacob's Ladder" exhibition.

Museum Facilities - In May 1987, the Anacostia Museum opened its new public exhibition and education facilities at Fort Stanton Park. In addition to consolidation of its facilities, the expanded facility provides better visitor accommodations, including off-street parking. Inaugural festivities included an invitational breakfast held on May 15, 1987 and a ribbon cutting ceremony and opening reception for the inaugural exhibition on Sunday, May 17, 1987. More than 1,700 people attended the inaugural exhibition opening.

Over the next few years, the Museum plans to initiate the development of a master plan to determine the long-range space needs for its research, exhibition and public service programs. Based on the results of this master plan, the Museum will evaluate different alternatives for future facilities development, including the possible relocation of the Museum to National Park Service land at Poplar Point, located near the future Anacostia MetroRail Station on the Green Line.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 2 workyears and \$70,000 is requested to strengthen and expand the Museum's research support by hiring a registrar and a librarian.

Since its founding in 1967, the Anacostia Museum has documented the history and culture of black Americans and their significant contributions to the heritage of this nation. Established as a cultural resource for the people of Anacostia, the Museum has grown over the past several years into a national resource for research and for interpretive and educational programs relating to black history and culture in America. The Museum does not presently have either a professional museum registrar or librarian. During the past few years, as the Museum has strengthened its research capabilities and expanded its exhibition program, the need for such research support has become critical. The requested increase will allow the Museum to professionalize its research support in these fields.

Without a registrar on staff, the Museum's research staff has had to take on these registrarial duties. Additionally, the Museum has sought support from elsewhere--including the National Portrait Gallery, the National Museum of American Art, the National Museum of African Art, the National Archives, the Library of Congress, and other national and private institutions and repositories--to ensure compliance with accepted policies and practices.

Over the years, as exhibitions and other programs of the Museum have become more ambitious, the reliance on objects loaned from other museums and private collections has greatly increased the amount of this additional work for the research staff, with

staff historians assuming curatorial and registrarial responsibilities for their projects. For instance, the recent exhibition on "The Renaissance" required the insured loans of some 250 objects; and the "Climbing Jacob's Ladder" exhibition involves the loan of 177 artifacts, valued in excess of \$500,000, from 40 locations around the country. This compares to 63 objects borrowed for the "Out of Africa" exhibit (produced in 1978-79). Because of the increasing dollar value of each of these loans as well as the number of artifacts and memorabilia, the responsibility of the Museum to lenders requires that these registrarial duties, including the documentation of the condition of objects when received, be conducted by a permanent professional museum registrar (1 workyear and \$29,000).

The new registrar position would also help to reduce the amount of time required to complete each exhibit project, since the research staff would no longer have to split their time between research and registrarial duties. The position would also provide necessary staff support for exhibitions developed by guest scholars/curators. When the noted scholar in the field of Afro-American Art History, Dr. David C. Driskell, served as guest curator for "Contemporary Visual Expressions," it was necessary to contract for registrarial services.

As the research capabilities of the Museum have developed, the reference library collection, which consists of approximately 1,500 volumes including serial runs and sets of encyclopedias, has expanded accordingly. Without the necessary organization or comprehensive planning to make it an effective research collection, it remains virtually unusable in its current condition (in temporary storage in boxes). The requested increase would allow the Museum to hire a professional librarian (1 workyear and \$24,000). The librarian's duties would include organizing and cataloguing the current collection; purchasing and cataloguing new books; borrowing books through inter-library loan for use by Anacostia staff; updating files using both the SIBIS and OCLC computer terminals; maintaining a circulation desk for both the Museum staff and the public; upkeeping shelves and books; and answering all public inquiries relevant to the library collections.

A sum of \$17,000 is also requested to purchase books and other library material; purchase book cases and other specialized library equipment; and provide other program support for these two positions, including travel, printing and reproduction, and other services.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - Funds are provided by an annual allotment to cover the salary costs of a woodcrafter. During FY 1988, this woodcrafter completed the fabrication of cases for the "Climbing Jacob's Ladder" exhibition. He will also fabricate free standing partitions for hanging the art work for the D.C. Art Association show; fabricate working models for the "A Continuing Tradition: Afro-American Contributions to American Technology" show; and cut and produce frames for photographs and posters. Additional funds derived from donations and exhibition rentals are used to purchase supplies and materials to support the Museum's programs.

Restricted Funds - These are in the form of gifts from organizations and individuals and are designated for the support of specific Museum programs.

CONSERVATION ANALYTICAL LABORATORY

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	34	2,402	-	-	-	21	1	55	-	2
FY 1988 -Estimate	41	2,409	-	-	-	20	1	50	-	-
-Base	41	2,432								
FY 1989 Estimate	41	2,456	-	-	-	20	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	41	-	41
11 Personnel Compensation.....	1,302	18	1,320
12 Personnel Benefits.....	191	6	197
21 Travel.....	45	-	45
22 Transportation of Things.....	27	-	27
25 Other Services.....	430	-	430
26 Supplies & Materials.....	166	-	166
31 Equipment.....	271	-	271
Total	<u>2,432</u>	<u>24</u>	<u>2,456</u>

Analysis of Increase

Necessary Pay..... 24

ABSTRACT - The Conservation Analytical Laboratory (CAL) is the Smithsonian's specialized research facility for all aspects of the conservation and technical study of museum objects. CAL advises and assists the Smithsonian and other museums in the study, preservation and conservation of objects of artistic, scientific, cultural and historical importance. Research is performed on the conservation related properties of materials, the improvement of conservation treatment technology, and the extraction of historical information from the technical record of the materials being studied. The knowledge gained from scientific research is applied directly to the actual treatment of objects, while the diversity and the wide variety in the state of preservation of these objects provides the overview needed to define directions in conservation research. Experience with a large range of materials and broad expertise

in analytical and technological studies enable CAL to engage successfully in a wide spectrum of interactive and collaborative research with anthropologists and art historians.

CAL conducts a conservation training program which includes basic and advanced conservation training, supports and organizes workshops and seminars, and provides various opportunities for the dissemination of the latest knowledge in the field of conservation to museums and research professionals throughout the United States and the world. No increase is requested for FY 1989. Necessary pay of \$24,000 is required for existing staff.

PROGRAM - CAL's activities are carried out in a number of interrelated programs: Archaeometry, Conservation Science, Conservation Treatment, Conservation Training, and Information. CAL's program of conservation treatment, supported by specialized scientific facilities and basic research in conservation science, is conducive to the success of its conservation training program.

Archaeometry - In the field of archaeometry, methods are developed for the chemical and physical analyses of museum objects and related materials, and the results of such analyses are integrated with the archeological, anthropological, art historical and cultural background data on the same materials. These analyses provide data concerning materials, dates, provenances, attributions and historical technologies, which, in combination with contextual information and topological and stylistical analyses, serve to answer anthropological or art historical questions.

CAL's programs of trace element characterization of archaeological ceramics and clay sources again produced large quantities of chemical analytical data on materials from various geographical and chronological contexts. These projects are conducted in collaboration with scholars from national and international academic and research institutions. For example, the project on archaeological Hopi ceramics involves many academic institutions as well as representatives of the Hopi Nation. The analytical work for its first phase, which endeavors to examine social interchanges and boundary maintenance during the period of the great migrations, has been completed. A second phase will examine the influences of the contact with the Spanish in the New World, as reflected in changes of style and technology. Work on materials from Mezo America resulted in close ties with academic institutions in Costa Rica.

The project on ceramics from the Middle East resulted in several working visits with collaborating French scholars, and an Italian collaborator will spend a postdoctoral fellowship at CAL during the coming year. Work continued also on ceramics from Spain and North Africa, while an exploratory study was started on Indian ceramics. Technological studies of ceramic materials centered on Far Eastern porcelains and stonewares, prehistoric Middle European materials, and faience from Egyptian, Middle Eastern and Far Eastern province.

In the lead isotope analysis program, the work on Chinese bronzes from the Sackler Collection was completed. CAL initiated a project on potential ore sources for early Near Eastern silver manufacture. Metallurgical studies were concluded on the technology of historic music wire and on iron technology in Britain during the early Iron Age and the Roman period. In collaboration with archaeologists at National Museum of Natural History, a study was made on the iron technology of early Iron Age materials excavated at Tell Jemmeh. Work continued on the chemical and mineralogical characterization of Mezo American jades and on the chemical analyses of natural resins used in the manufacture of objects from South East Asia.

In the joint program with the National Bureau of Standards and the National Museum of American Art on the autoradiographic studies of paintings by Thomas W. Dewing and Albert P. Ryder, special emphasis was placed on the study of the latter artist. This project, which also involves the utilization of a number of other techniques for the examination and analysis of these paintings, has provided new information on the process of the creation of these works.

The utility of the Smithsonian Archaeometric Research Collections Records (SARCAR) data base was greatly enhanced through the inclusion of stylistical, topological and provenience data for the analyzed materials, which permits a direct linking of these data in the formation of statistical groupings.

Conservation Science - CAL's conservation science program pursues research into the characterization of chemical and physical processes involved in the deterioration of materials in museum collections and the assessment of parameters, both external and internal, which affect the rates of these processes. Chemical and physical analyses and technical examinations are performed in support of conservators and curators Institution-wide.

Research is fully under way in an important study of the chemical and physical effects of fumigation on proteinaceous materials in museum objects. This project is conducted in collaboration with other conservation research institutions in the United States and Canada, and receives financial support from the Getty Conservation Institute.

For the research program on the conservation of photographic materials, authorized in FY 1986, a special advisory committee consisting of experts from industry and the museum community assisted in the selection process for a special staff member to start research in this area. The study evaluating conditions for accelerated aging of paper produced extremely interesting results and will continue.

In research on the influence of climatic and environmental factors, studies were made of the interaction of controlled climates in historic buildings and the fabric of these buildings. The installation of temperature and humidity sensors in the new facade of the Renwick Gallery was completed, and the collection of data began. With the recruitment of a materials research engineer in FY 1987, research in the mechanical processes resulting from environmental factors, as well as other aging processes, can now be pursued with greater sophistication. Studies of specific mechanical properties of materials and their interactions in art objects have begun.

Conservation scientists collaborated with conservators Institution-wide on a number of joint research projects and provided analytical and technical support to conservators and curators in a number of bureaus.

Conservation Treatment - CAL conservators pursued a variety of projects aimed at the development, improvement and testing of treatment technology. Subjects such as the wavelength dependency of efficiency and safety for light induced bleaching of discolored paper; a new method for surface cleaning of large marble statuary; the side effects of boiling archeological iron artifacts in water for chloride removal; the deterioration of weighted silks; the stability of certain pigment/binder systems for textiles; the effects on the binding of fibers by solvents used in paper treatment; and the evaluation of consolidants for treatment of archeological plaster, were researched, often in close collaboration with the conservation scientists.

Smithsonian museums primarily rely on their in-house conservation staff for the maintenance of their collections and the performance of treatment procedures. CAL did, however, assist the museums in cases where the complexity of the problem required special research and the use of specialized equipment, or when the necessary expertise is not available in-house. Such assistance was provided in the form of condition surveys, consultations, and actual treatments on a wide variety of objects for many bureaus.

CAL continued conservation support of the excavations at Harappa, Pakistan; a CAL objects conservator spent six weeks at this important site treating excavated objects and teaching staff at the local museum on the care of these objects.

Conservation Training - The activities in the conservation training program were expanded significantly with several new initiatives which were made possible through the Congressional allocation of additional funds for this purpose. These include the establishment of a number of postgraduate conservation internships at various conservation laboratories in the Smithsonian and a joint program with Johns Hopkins University for the training of conservation scientists. These funds were also used for contracts with other academic programs nationally to ensure continuation of their activities.

The first class of CAL's own entry level training program for furniture conservators completed its first year successfully. This innovative new program is attracting wide attention in the profession. Again, CAL organized a number of special courses for practicing conservators on subjects such as the metallurgy of archeological artifacts, the conservation of marquetry and bouille work, the conservation and restoration of faux finishes, and the production of replicas through electroforming. For collections managers and curators of small museums, a course on the effects and control of environmental conditions was organized.

A number of interns were supported again, at various levels of expertise and experience. Four summer internships in textile conservation, two in objects conservation, and one in paper conservation were awarded to students in an early stage of their professional training. A paper conservation student spent a year at CAL in fulfillment of the requirements for graduation at an academic training program. The objects laboratory hosted two postgraduate interns, while two paintings conservators from Germany and Venezuela spent postgraduate internships in CAL's paintings laboratory. CAL conservators frequently served as faculty in conservation workshops organized at the Smithsonian and elsewhere.

Information - The information program provides bibliographic and reference support to CAL's staff and conservators within and outside the Smithsonian, as well as public information on conservation questions from the general public. Together with six other major international organizations and institutions, CAL is a contributing member of the Conservation Information Network, a new major international data base on conservation information. This collaborative network, made possible by financial support from the Getty Conservation Institute, which was made available to conservation professionals worldwide, enables CAL staff to access a far wider range of references than its own extensive reference collections would afford.

CAL's unique, extensive collection of reprints from the conservation and related literature was enhanced through the addition of many new entries and the improvement of indexed access to the information. Activities continued in the public information

program, where questions from the general public on conservation matters are answered by the appropriate expert and information is provided to museum professionals from all over the United States.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from the nominal fee charged to participants in the advanced conservation specialist courses sponsored by CAL. These fees are used to partially offset the expenses incurred in the organization of these courses. Support from the Research Opportunities Fund provided for the collection of ethno-botanical data and resin samples in Peninsula Malaysia and Sumatra. A grant from the Scholarly Studies Program provided support for the continued study of the Hopi Indians.

Restricted Funds - Funds provided in 1986 in the form of gifts and grants from individuals, organizations or corporations for specific purposes supported work in 1987. A grant from the Santa Fe Pacific Foundation supported a visiting scholar working on the study of Hopi ceramics. In addition, the Getty Conservation Institute provided funds in support of a multi-year study on the effects of fumigants on materials in museum collections.

OFFICE OF EXHIBITS CENTRAL

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	45	1,700	-	-	-	-61	-	-	-	-
FY 1988 -Estimate	46	1,830	-	-	-	-7	-	-	-	-
-Base	46	1,853								
FY 1989 Estimate	46	1,882	-	-	-	-13	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	46	-	46
11 Personnel Compensation.....	1,342	22	1,364
12 Personnel Benefits.....	142	7	149
21 Travel.....	2	-	2
23 Rent, Communications & Utilities.....	2	-	2
24 Printing & Reproduction.....	2	-	2
25 Other Services.....	55	-	55
26 Supplies & Materials.....	188	-	188
31 Equipment.....	120	-	120
Total	<u>1,853</u>	<u>29</u>	<u>1,882</u>

Analysis of Increase

Necessary Pay..... 29

ABSTRACT - The Office of Exhibits Central (OEC) is essential to the successful mounting of a great many of the exhibitions presented at the Smithsonian. The highly skilled exhibition specialists and the well-equipped facilities of OEC provide those Smithsonian units having little or no specialized exhibition capability with invaluable and substantial support. The vast majority of the projects assumed by OEC are unique and involve the exhibition of specific objects from the collections of the Institution, other museums, and private collections. The value of these objects requires that OEC maintain the highest standards in its work. For this reason, meticulous attention to detail and appropriate care in the handling of museum objects have always characterized the work performed by OEC. No program increase is requested

for FY 1989. Necessary pay of \$23,000 is required for existing staff, along with .25 workyears and \$6,000 required to annualize the partial-year funding of 1 new position approved in the FY 1988 budget.

PROGRAM - The Office of Exhibits Central provides professional services in all phases of exhibition production. In FY 1987, OEC designed and produced 20 exhibitions for the Smithsonian Institution Traveling Exhibition Service (SITES). "Russia: The Land, The People," an exhibition organized by SITES, consisted of 65 Russian paintings from Moscow and Leningrad, which had to be reframed and protected with Lexan, a protective covering. This was done under the supervision of a Russian conservator. OEC also produced the introductory panel and labels, installed the exhibit in the Renwick Gallery, and upgraded the Russian-built crates for travel in the United States.

In addition to preparing several hundred customized shipping containers for various exhibitions, the OEC Fabrication Unit built 72 crates for the "Magnificent Voyagers" exhibit alone. Of a total of 72 crates, five were unique (even by OEC standards), designed to safely travel the model ships. The Model Shop also remade the Fiji club dancer mannequin to ensure its safe travel, and OEC packed and crated well over 400 objects in the exhibition for travel. The OEC Graphics Unit contributed to the success of the 21st Festival of American Folklife by mounting almost 320 photographs and silk-screening information on over 200 panel surfaces. OEC provided support to the Smithsonian Associates by designing, writing, editing and supervising the printing of more than 50 brochures for its travel programs. Similar support was provided to the Women's Committee of the Smithsonian Associates for their annual Craft Show and Christmas Dance.

OEC staff continues to serve as faculty in the "Workshops for Museum Professionals" organized by the Office of Museum Programs, and as consultants on Institution-wide planning for exhibitions, graphics, and the design and use of public spaces on the Mall and in Smithsonian museums.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are provided by proceeds from the sale of the OEC book A Freeze-Dry Manual through the Smithsonian Institution Press and reimbursements from internal Smithsonian units. These funds are used to purchase supplies, materials and services in support of OEC activities, to defray costs associated with special events and, as needed, to supplement a portion of travel expenses associated with consultation with other museum professionals.

SMITHSONIAN INSTITUTION TRAVELING EXHIBITION SERVICE

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	11	635	7	250	24	2,654	3	417	-	124
FY 1988 -Estimate	15	620	8	300	23	1,809	1	1,583	-	19
-Base	15	627								
FY 1989 Estimate	15	667	8	314	23	1,953	-	920	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	15	-	15
11 Personnel Compensation.....	397	8	405
12 Personnel Benefits.....	57	2	59
21 Travel.....	15	-	15
22 Transportation of Things.....	67	-	67
23 Rent, Communications & Utilities.....	26	-	26
25 Other Services.....	25	30	55
26 Supplies & Materials.....	30	-	30
31 Equipment.....	10	-	10
Total	627	40	667

Analysis of Increase

Necessary Pay.....	10
Program Funds.....	30

ABSTRACT - The Smithsonian Institution Traveling Exhibition Service (SITES) provides an important national service by offering carefully selected, well designed, and widely circulated traveling exhibitions. The exhibitions draw upon the collections of the Smithsonian, United States and foreign museums, foreign governments, private individuals, and organizations throughout the world. During FY 1987, SITES relocated to the Quadrangle. For FY 1989, an increase of \$30,000 is requested to continue research on Latin American exhibition themes for the Quincentenary celebration of the Columbus expedition. Necessary pay of \$6,000 is

required for existing staff, along with .25 workyears and \$4,000 required to annualize the partial-year funding of 1 new position approved in the FY 1988 budget.

PROGRAM - The Smithsonian Institution Traveling Exhibition Service is the primary organizer of Smithsonian traveling exhibitions. SITES, which is the largest service of its kind in the United States, provides a broad selection of exhibitions encompassing the diverse disciplines and subject matter represented in the collections of the Smithsonian. These disciplines include the arts, natural history, design, archeology, anthropology, science and technology, decorative arts and crafts, and popular culture. SITES' exhibitions are accompanied by curatorial and registrarial information, handling instructions, technical information, publicity materials, suggested educational activities and public programs, and in most instances, publications. SITES also provides professional assistance on a variety of topics, including the shipping and insuring of artifacts, installation techniques, exhibition security, design and upgrading of exhibition space, and contract matters.

SITES represents an important Smithsonian outreach and service program. At any time, over 120 exhibitions are in continuous circulation or planning and production stages. These exhibitions are seen by approximately five million people each year at museums, galleries, and educational and cultural institutions around the world. Since its establishment in 1952, SITES' exhibitions have reached an estimated audience of over 110 million people in 15,000 communities. The national audience learns of SITES' exhibitions in local communities through the Smithsonian magazine and other cooperative publicity efforts of the Institution. Update, SITES' annual catalogue of available exhibitions, and its quarterly newsletter, Siteline, are received annually by over 9,000 institutions and individuals in cultural organizations around the world.

Thousands of organizations depend on SITES' exhibitions to meet their programming needs. For a fraction of their own developmental costs, exhibitors are able to bring the Smithsonian's cultural programs to their own communities. SITES' total operating budget can be divided into two general categories: direct subsidies and recoverable costs. Non-reimbursable support consists of three funding sources: a Federal appropriation, a limited amount of nonappropriated Trust fund support from the Institution, and outside grants and contracts. All remaining operating costs must be recovered by SITES through rental fees charged to exhibitors. This percentage is expected to increase in FY 1988. To the extent that Federal appropriations decrease the total expenses that must be recovered through participation fees, Federal assistance enables SITES to keep participation fees low and affordable to cultural institutions nationwide.

During FY 1987, 396 SITES' exhibitions traveled in the United States to 227 cities in 45 states and the District of Columbia as represented below:

Alabama	9	Montana	0
Alaska	4	Nebraska	3
Arizona	2	Nevada	5
Arkansas	3	New Hampshire	2
California	24	New Jersey	4
Colorado	14	New Mexico	13
Connecticut	3	New York	19
Delaware	0	North Carolina	10
District of Columbia	8	North Dakota	0
Florida	22	Ohio	17
Georgia	11	Oklahoma	6

Hawaii	2	Oregon	5
Idaho	1	Pennsylvania	21
Illinois	12	Rhode Island	2
Indiana	10	South Carolina	3
Iowa	8	South Dakota	0
Kansas	6	Tennessee	13
Kentucky	7	Texas	25
Louisiana	7	Utah	2
Maine	5	Vermont	0
Maryland	9	Virginia	4
Massachusetts	15	Washington	6
Michigan	16	West Virginia	4
Minnesota	5	Wisconsin	8
Mississippi	5	Wyoming	2
Missouri	5		

SITES maintains an active international program, sharing collections from the Smithsonian and other sources in addition to exhibition expertise with millions of people in other countries. In FY 1987, nine SITES exhibitions traveled abroad: "People of the Forest: Photographs of the Maya by Gertrude Blom" traveled to The Netherlands; and "Kings, Heroes, and Lovers" was on view in Puerto Rico. Canadian institutions hosted several exhibitions, including "Master Weavers"; "Know What You See: The Examination and Treatment of Paintings"; "Genre Scenes"; "America's Space Truck: The Space Shuttle"; "Unfamiliar Fauna of the Open Sea" (two bookings); and "Gauguin and His Circle in Brittany."

A major goal of SITES is to share the resources of the Smithsonian at reasonable fees. Smaller museums and organizations look to SITES for light-weight, easily installed, low-cost exhibitions. SITES perfected this type of show during the 1970s. Another specialized exhibition format SITES developed is the poster panel exhibition. The four currently available may be purchased directly and range from black history to science. In FY 1987, SITES released the poster panel show "Diversity Endangered" treating the global problems of vanishing species and habitats. For the first time, SITES offers cardboard kiosk mounts for this show, as well as an educational videotape.

SITES estimates that 52 new exhibitions will begin their tours during FY 1988 and FY 1989. Among the major new exhibitions for FY 1988 are: "A Russian Impressionist: Paintings and Drawings by Leonid Pasternak"; "King Herod's Dream: Caesarea on the Sea"; "Master Watercolors and Drawings from the Norton Gallery of Art"; "New Horizons: American Painting 1850-1910"; "Views of Rome: Watercolors and Drawings from the Collection of the Biblioteca Apostolica Vaticana"; and "Voices of Hellenism: The Collection of Anthony Benaki." The number of new exhibitions each year fluctuates between 25 and 30. Each exhibition, whether from internal or external sources, requires approximately two years to develop and fabricate. In September 1987, "Generations," a major exhibition organized by SITES in conjunction with the International Center, opened as the inaugural exhibition in the Smithsonian's new International Gallery. In May 1988, "Tropical Rainforests: A Disappearing Treasure" will be the second SITES exhibition to be installed in this International Gallery.

Major Organizational Changes and Developments

In FY 1987, SITES relocated to the new Quadrangle facility. Over the course of this fiscal year, SITES hired an education workshop coordinator to operate the new

workshop for museum colleagues; planned for the proper outfitting and installation of exhibitions in a small Introductory Gallery; worked closely with the International Center to produce "Generations"; and broadened the international reach of the exhibition program through projects such as pan-Institutional exhibitions celebrating the Quincentenary. SITES' top long-range priorities are to continue to develop exhibitions originating from Smithsonian collections and research and to take these exhibitions to minority audiences.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, a program increase of \$30,000 is requested to continue research and investigation of exhibition themes for the Columbus Quincentenary celebration. In FY 1988, with base funds of \$25,000 SITES investigated exhibitions that explore themes relevant to the Quincentenary. In order to continue this necessary research, additional program funds are required to enable essential curatorial research and travel as well as exhibition production.

Among the exhibitions currently under investigation are: "Columbus In America," a major art exhibition on the artistic iconography of Columbus' exploratory ventures; "Seeds of Change," in conjunction with the National Museum of Natural History, an exhibition examining the flora exchanged between the Old and New Worlds as a result of European exploration in the Americas; "Luis Barragan: The Architecture of Color, Light, and Form"; "Plains Indian Art: Continuity and Change," concerning American Indian art; "Indian Ledger Book Art," an exhibition recording the visually narrative tales of American Indian life; and "Rosebud Sioux," a photography exhibition documenting the changing lives of the Rosebud Sioux in South Dakota, 1890-1910, as captured in the images of John Anderson.

Should this increase not be granted, SITES would be unable to allocate scarce staff time and resources toward any Quincentenary effort. This would negatively affect priorities of increasing the international breadth and quality of the program.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are derived from participation fees collected from museums, universities, historical societies, and other recipients of traveling exhibitions. These funds, supplemented by an allotment, support virtually all exhibition development costs including salaries and benefits, publications, materials, outside specialists, and contractual services. Funding from the Institutions' Special Exhibition Fund has been provided to support "King Herod's Dream: Caesarea on the Sea."

Restricted Funds - Funds are provided in the form of gifts and foundation grants from individuals, organizations, and corporations for specific purposes. During FY 1987, several grants were received: from PepsiCo International, Inc. and Armand Hammer Foundation for "Russia, The Land, The People: Russian Painting 1840-1910"; from PepsiCo International, Inc. for "New Horizons: American Painting 1840-1910"; from American Express for "Diamonds Are Forever: Artists and Writers on Baseball"; and from the MacArthur Foundation and the Gund Foundation for "Tropical Rainforests: A Disappearing Treasure."

During FY 1988 and FY 1989, major funding is expected for the following exhibitions: "Frank Lloyd Wright" (from Domino Pizza Corporation); "Irish Decorative Arts from the National Gallery of Ireland"; "The Jewelry of Morocco"; "Pioneering the Space Frontier"; "Splendor and Seclusion"; "Turkish Rugs"; "Views of Rome:

Watercolors and Drawings from the Collection of the Biblioteca Apostolica Vaticana"; and "The Voices of Hellenism: The Collection of Anthony Benaki."

Government Grants and Contracts - These funds are provided by various levels of government for support of specific exhibitions.

ASSISTANT SECRETARY FOR PUBLIC SERVICE

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	25	1,326	40	2,177	-	260	-	93	-	-
FY 1988 -Estimate	23	1,267	42	2,540	-	77	-	-	-	-
-Base	23	1,281								
FY 1989 Estimate	23	1,294	43	2,713	-	83	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	23	-	23
11 Personnel Compensation.....	853	9	862
12 Personnel Benefits.....	130	4	134
21 Travel.....	13	-	13
23 Rent, Communications & Utilities.....	20	-	20
24 Printing & Reproduction.....	67	-	67
25 Other Services.....	120	-	120
26 Supplies & Materials.....	45	-	45
31 Equipment.....	33	-	33
Total	<u>1,281</u>	<u>13</u>	<u>1,294</u>

Analysis of Increase

Necessary Pay..... 13

ABSTRACT - The Office of the Assistant Secretary for Public Service encourages and supports the development of programs to advance the Institution's objectives in education, publication, information, electronic media, folklife programs and the development of wider audiences. It advises the Secretary on general policy issues and program planning for Public Service activities. Included in this line item are the Office of the Committee for A Wider Audience, the Office of Telecommunications, the Visitor Information and Associates' Reception Center, and the Office of Public Affairs. No program increase is requested for FY 1989. Necessary pay of \$13,000 is required for existing staff.

PROGRAM - I. The Office of the Assistant Secretary for Public Service: With base resources of 4 workyears and \$238,000, the Office of the Assistant Secretary for Public Service coordinates and supervises the Institution's educational and public service programs and advises the Secretary on the development of policies and activities for these programs. The bureaus and offices reporting to the Assistant Secretary include the Office of Telecommunications; the Visitor Information and Associates' Reception Center; the Office of Public Affairs; the Smithsonian Institution Press; Smithsonian magazine and Air and Space magazine; the Office of Folklife Programs; the Office of Interdisciplinary Studies; the Office of Elementary and Secondary Education; the Office of the Committee for A Wider Audience; and the National Science Resources Center.

II. Office of Telecommunications: With base resources of 5 workyears and \$233,000, the Office of Telecommunications (OTC) produces radio, film, and television programs on the Smithsonian's varied scholarly activities. These wide-ranging programs, broadcast nationally, inform the public and support the research, exhibitions and educational goals of the Institution. Available to educational institutions and libraries, these programs have garnered enthusiastic response from audiences and recognition and honors from the broadcast and film industries.

The Office produces two major program series. "Here at the Smithsonian...", an award-winning series of video features, launched its sixth season with 180 subscribing stations, reaching more than 50 percent of the prime-time viewing audience in the United States according to the National Academy of Television Arts and Sciences. "Radio Smithsonian," a weekly 30-minute series, continues as the oldest of the Institution's various broadcast efforts. Now in its 18th year, it has become a staple for many member stations of National Public Radio with a potential weekly listening audience of four million people. Programs focus on exhibitions, research and performance activities throughout the Institution.

In FY 1987, the Office completed 13 film and video projects. Examples include: "From Reliable Sources," a film produced at the request of the Archives of American Art, depicting the Archives' activities and its role 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. Captioned for the hearing impaired, it addresses the specific needs of visitors with various disabilities and accompanies a comprehensive training manual. It will be distributed to over 500 museums and historic sites across the Nation. "Diversity Endangered" is a videotape produced to accompany a Smithsonian Institution Traveling Exhibition Service poster-panel exhibition for sale to schools, libraries and museums nationwide to help raise awareness about biological diversity and how it is threatened by human activities. "Field to Factory," a tape produced for showing in the National Museum of American History exhibition, tells the story of the black migration from the rural south to the urban north between 1915 and 1940. Finally, "Engines of Change" is a video epilogue for this major National Museum of American History exhibition which explores America's metamorphosis from an agricultural nation to an industrial power.

Projects that are currently in production cover an equally wide spectrum. "Magnificent Voyagers," a film on the 1838-1842 U.S. Exploring Expedition (the Wilkes Expedition), was requested by the National Museum of Natural History's Office of Education. It is designed for wide circulation to the educational market. Another film nearing completion will document efforts to construct a prototype leading to the building of a model of the Earth's biosphere, ultimately intended for use in the 21st

century for space colonization. This film was requested by the Marine Systems Laboratory. In yet another direction, a multi-segment interactive video disc is in production which will be a major component for the future National Museum of American History exhibition, "A Material World." OTC is working with the Museum's Department of Science and Technology on this project. A 15-20 minute videotape is in production for the Visitor Information and Associates' Reception Center for the new Orientation Center in the Castle. Designed to introduce the first-time visitor to the entire complex of Smithsonian museums in Washington, D.C., it will provide information on the origins of the Institution, the building locations and highlights of the collections. Also for the Orientation Center, the Office is overseeing development of interactive video materials providing visitors with specific, individualized information on the collections and exhibits of all the museums.

Research and pre-production planning have been initiated on several significant projects. A new Smithsonian radio series would prominently feature performances of music from around the world combined with informational segments from all parts of the Institution. Development continues at an accelerated pace on the proposed television/interactive video project for children ages nine to 12, tentatively titled "Smithsonian Quest." With the Bank Street College of Education as a prospective partner, the Office is working out a project design and business plan, which will serve as the basis for discussions with commercial firms producing interactive hardware and software. In addition, the Office plans to encourage and help develop new interactive programming for other media projects growing out of exhibition and education programs of Smithsonian bureaus. The development of program ideas for video and film productions with appeal for minority audiences is being actively pursued. Initial emphasis will be placed on subjects that would interest the Hispanic community.

III. Visitor Information and Associates' Reception Center: With base resources of 2 workyears and \$178,000, the Visitor Information and Associates' Reception Center (VIARC) provides the public with information on Smithsonian exhibitions, events, programs and activities, and administers a range of centralized information and assistance programs which serve the public, Associate members, Smithsonian staff, volunteers, and interns.

VIARC's seven-day services include the staffing of 16 information desks in 11 museums by a corps of some 500 Volunteer Information Specialists and the operation of the Institution's primary telephone information service, which also provides 24-hour recorded information on Dial-A-Museum and Dial-A-Phenomenon. VIARC also serves as the primary research, response, and referral point for public inquiry mail; operates an outreach program to promote previsit education; presents a variety of daily slide/lecture orientation programs for visitors; and conducts behind-the-scenes tours of the Castle Building. During the summer months when visitation is at a peak, VIARC supplements the information services available in the museums with mobile information units on the Mall. In addition, VIARC conducts a registration and placement program for the approximately 1,200 volunteers who assist behind the scenes pan-Institutionally, and a similar registration program for interns.

To strengthen the Institution's ability to better inform, orient, and serve its millions of visitors, VIARC has developed a multifaceted program to upgrade services provided by the Institution. Some significant components of this project are a pre-visit education program aimed primarily at the local, national and international tour and travel industry; the development of a uniform system of identification for Smithsonian facilities; pedestrian and vehicular directional signs; updating of

general information directories on the Mall; and the establishment of the Smithsonian Information Center in the Castle Building, which will provide a primary point of information and orientation.

IV. Office of Public Affairs: With the base resources of 12 workyears and \$632,000, the Office of Public Affairs (OPA) is responsible for acquainting the public with the programs and policies of the Institution. This is achieved with news releases, the Smithsonian News Service, feature articles, Research Reports, calendars, radio and television public service announcements, guides, brochures, contacts with journalists, news conferences, and paid advertisements. OPA provides advice to the individual bureaus and offices on public information policies and programs; OPA also monitors the units' public information materials, the Institution's many relations with corporate and other sponsors, and the advertising and promotional plans and materials of corporate sponsors. OPA produces a monthly staff newspaper, The Torch, and informs management of public and media attitudes and needs. The OPA director serves as the principal Institutional spokesperson.

For the past eight years, the Smithsonian News Service has provided some 2,000 daily and weekly newspapers with a free, monthly package of four feature-style articles on subjects in art, history, science, technology, and contemporary life. In September 1986, the News Service launched a Spanish-language edition, which is distributed to approximately 100 Hispanic and bilingual newspapers in the United States (including Puerto Rico) and Canada. The Hispanic edition, which provides one article per month in Spanish, has been greeted with enthusiastic reviews, and OPA plans to expand distribution into Latin America in FY 1988. OPA also distributes News Service articles to client newspapers at cost through the Associated Press DataFeature wire.

In 1987, OPA continued and expanded its plan for reaching a broad range of ethnic communities, including blacks, Hispanics, Asian-Americans and Americans Indians. The plan involves preparation and distribution of news releases, brochures, public service announcements for radio and television and direct media contact. In FY 1987, OPA completed a brochure for the Anacostia Museum, dioramas for the Metro rail system on the theme "Explore Your Heritage," and a TV public service announcement along the same theme--all aimed primarily at the black community. Outreach aimed at the Hispanic community involved the preparation of news releases in Spanish on the Festival of American Folklife and other relevant Smithsonian programs, a briefing for Hispanic media on the Columbus Quincentenary, translation and distribution of the Monthly Calendar of Events in Spanish and the preparation of the Institution's visitor slide show in Spanish. Further activities are planned in FY 1988, including additional paid advertisements in black and Hispanic media and public service announcements for television and radio directed at black, Hispanic and Native American audiences.

OPA continued to focus on the communication of research activities to the media through direct contact with journalists, resulting in many major articles appearing in such national publications as the New York Times and the Washington Post. The circulation of Research Reports, a periodical devoted to reports on research in the arts, history, and science reached a record in FY 1987 of nearly 46,000 readers including the scholarly community, foundations, universities, and Smithsonian contributing members.

In FY 1987, OPA conducted and coordinated an extensive media campaign associated with the opening of the Enid A. Haupt Garden and the Smithsonian's new museum, research, and education complex in the Quadrangle. This included the production of

revised editions of the Smithsonian's main visitor brochure, Welcome (including six foreign languages), "Explore Your Heritage," "Guide for Disabled Visitors," "Yesterday and Today" (a guide for journalists), and a commemorative VIP brochure; special press kits; paid advertisements in national media; radio and television public service announcements; and an exhibition at the Martin Luther King Library in Washington, D.C.

The Office continues to receive acclaim for the work of its staff from the National Association of Government Communicators, the Society for Technical Communications, and the American Association of Museums.

NONAPPROPRIATED SOURCES OF FUNDING:

I. Unrestricted General and Special Purpose Funds - The Office of the Assistant Secretary for Public Service: These funds are provided by allotments that cover: the salary and benefits of staff members assigned to the immediate office of the Assistant Secretary for Public Service, electronic media activities, and costs for the Office of the Committee for A Wider Audience (including the Cultural Education Committee), which fosters the development of pan-Institutional outreach efforts designed to attract diverse cultural audiences.

II. Office of Telecommunications: These funds are provided by allotments which support the production of educational and informational materials for television, film and radio. In addition, a nominal subscription fee is received for certain programs to help defray the production and distribution costs. Additional funds are obtained through sales of films and video-tape programs. The Office produces two ongoing series of programs which reach the American public regularly through radio and television. "Here at the Smithsonian...", a series of television features, and "Radio Smithsonian," a weekly half-hour magazine program, are financed partly by an allotment and partly by subscriber fees.

III. Visitors Information and Associates' Reception Center: These funds are provided by an allotment and are used to support the Center's work as the Institution's public service bureau responsible for the information and assistance activities described in the program statement.

IV. Office of Public Affairs: These funds are provided by allotments which support public outreach activities such as publication of the Institution's Welcome brochure, Washington Post calendar and other advertisements, wider audience advertising with the black, Hispanic, and Native American media, and public service announcements for radio and television.

SMITHSONIAN INSTITUTION PRESS

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	25	1,110	37	11,880	-	240	-	-	-	4
FY 1988 -Estimate	29	1,192	37	13,195	-	-	-	-	-	-
-Base	29	1,209								
FY 1989 Estimate	29	1,226	37	15,055	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	29	-	29
11 Personnel Compensation.....	957	12	969
12 Personnel Benefits.....	141	5	146
21 Travel.....	2	-	2
24 Printing & Reproduction.....	48	-	48
25 Other Services.....	38	-	38
26 Supplies & Materials.....	10	-	10
31 Equipment.....	13	-	13
Total	<u>1,209</u>	<u>17</u>	<u>1,226</u>

Analysis of Increase

Necessary Pay..... 17

ABSTRACT - A member of the Association of American University Presses since 1966, the Smithsonian Institution Press is responsible for the editing, design, production, and distribution of books, sound recordings, and other printed materials prepared by staff scientists, historians, curators, as well as scholars from educational institutions around the world. Such materials also include research monographs, technical and scientific series, exhibition catalogues for Smithsonian museums, educational pamphlets, and informational leaflets. No program increase is requested for FY 1989. Necessary pay of \$17,000 is requested for existing staff.

PROGRAM - The Federal publication activity of the Press is a fundamental extension of the Smithsonian's basic research activities. The scientific,

technological, and historical monographs published by the Press make the results of research by Smithsonian curators and staff experts available to libraries, museums, scientific institutions, and interested members of the public throughout the United States and abroad. Increasingly over the last several years, the process of assembling the data and writing the monographs has been computerized. During FY 1986 the Press added microcomputer-based "desktop publishing" techniques that use electronic manuscripts and eliminate expensive typesetting. In addition to publishing research findings, the Press edits and designs exhibition catalogues, educational pamphlets, and informational leaflets that serve the millions of visitors to the Smithsonian in Washington, D.C., and the extensive programs conducted all over the Nation and around the world.

Additionally, the Press acts as the official agent of the Smithsonian Institution in procuring services from the U.S. Government Printing Office to create government forms, museum guides, and instructions, as well as in providing professional assistance to Smithsonian authors upon request. The Press also edits, designs, and produces Smithsonian Year, the Institution's annual report to the Regents and the Congress.

Federally funded books published during FY 1987 include "The Allende Meteorite Reference Sample," by Eugene Jarosewich et al. (Smithsonian Contributions to the Earth Sciences, #26); "A History, Bibliography, and Annotated Account of the Benthic Marine Algae of Taiwan," by Jane E. Lewis and James N. Norris (Smithsonian Contributions to the Marine Sciences, #29); "Biology of Freshwater Fishes of the Bermuda Ocean Acre," by Robert H. Gibbs, Jr., and William H. Krueger (Smithsonian Contributions to Zoology, #452); "The Korean Onggi Potter," by Robert Sayers with Ralph Rinzler (Smithsonian Folklife Studies, #5); and "A Brief History of Geomagnetism and a Catalog of the Collections of the National Museum of American History," by Robert F. Multhau and Gregory Good (Smithsonian Studies in History and Technology, #348).

In 1987, the Smithsonian Institution Press book program continued to publish books acclaimed by critics and reviewers, such as The Music Men: An Illustrated History of Brass Bands in America, 1800-1920, by Margaret Hindle Hazen and Robert M. Hazen. 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.

The University Press 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 20th-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.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are derived from the sale of trust-funded books, recordings, royalties, and special publishing services.

These funds support the necessary services required to develop, market, warehouse, and distribute records and scholarly and general interest books, which are published in connection with the Institution's research collections, exhibitions, and other programs.

In 1987, the University Press division added Focke-Wulf Fw 190: Workhorse of the Luftwaffe, as the latest volume in the Famous Aircraft of the National Air and Space Museum Series that now includes nine titles. The new Smithsonian Series in Archaeological Inquiry was introduced by a major study on The Archaeology of Western Iran. Ongoing is the Smithsonian Series in Ethnographic Inquiry to which were added two volumes, Independents Declared: The Dilemmas of Independent Trucking and Pintupi Country, Pintupi Self: Sentiment, Place, and Politics Among Western Desert Aborigines. Celebrating the architectural story behind the Quadrangle development is A New View from the Castle by Smithsonian magazine writer Edwards Park.

The Smithsonian Collection of Recordings publishes both popular recordings suitable for direct mail marketing to Smithsonian Associates and recordings of scholarly interest. During FY 1987, the Recordings program released the revised edition of its critically acclaimed seven-disc Smithsonian Collection of Classic Jazz, updating the album notes, upgrading the sound quality, and adding a seventh disc. The six-disc Singers and Soloists of the Swing Bands was available for distribution in August 1987. Also released was the two-disc Jimmie Rodgers: America's Blue Yodeler programmed and annotated by Jimmie Rodgers expert Nolan Porterfield. The Recordings program copublished with Cambridge Records The Mt. Calvary Church Organ recorded by John Fesperman, and with Nonesuch Records copublished Stephen Albert's Into Eclipse. This year, as in 1985 and 1986, a Smithsonian Collection release, Virtuosi, was nominated for a National Academy of Recording Arts and Sciences (NARAS) "Grammy" award in the category of Best Album Notes and also received the American Society of Composers, Authors and Publishers (ASCAP) Deems Taylor Award for the album notes.

Smithsonian Books, the popular book division of the Press, publishes books for a general audience on subjects that relate to Smithsonian collections and research interests. These books are marketed primarily by direct mail to Smithsonian Associates and other mailing lists, and are also sold to the general public through several trade publishers. Some of the titles currently available are The Smithsonian Book of Flight, The Smithsonian Book of North American Indians, Treasures of the Smithsonian, and The National Museum of Natural History. The goal of the program is to continue publishing books of general interest to the Associates that are well written, carefully researched, commercially successful, and critically well received.

OFFICE OF INTERNATIONAL ACTIVITIES

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	11	622	11	651	-	85	-	33	-	18
FY 1988 -Estimate	13	787	10	654	-	150	-	160	-	-
-Base	13	794								
FY 1989 Estimate	13	799	10	649	-	150	-	161	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	13	-	13
11 Personnel Compensation.....	378	4	382
12 Personnel Benefits.....	49	1	50
21 Travel.....	55	-	55
22 Transportation of Things.....	7	-	7
23 Rent, Communications & Utilities.....	5	-	5
24 Printing & Reproduction.....	28	-	28
25 Other Services.....	251	-	251
26 Supplies & Materials.....	9	-	9
31 Equipment.....	12	-	12
Total	<u>794</u>	<u>5</u>	<u>799</u>

Analysis of Increase

Necessary Pay..... 5

ABSTRACT - The Office of International Activities (formerly the Directorate of International Activities) serves to monitor, coordinate, and enhance the Smithsonian-wide endeavors in the international field. The work of the Office is conducted in three divisions: a program staff primarily responsible for planning the programs of the International Center and for providing necessary liaison and coordination for certain institutional activities; an Office of Service and

Protocol; and an Office of Publications Exchange. The Office also has had responsibility for overall Smithsonian planning of the 1992 commemoration of the 500th anniversary of the landing of Columbus in the Americas and administration of the Special Foreign Currency Program. During the latter part of FY 1987, an internal review of these operations was undertaken. The results of this review are currently being studied and will likely lead to a rearticulation of parts of these activities among other Smithsonian units as a means of reinforcing the overall focus of Smithsonian international activities. No program increase is requested for FY 1989. Necessary pay of \$5,000 is required for existing staff.

PROGRAM - International programs have played an important role within the Smithsonian from its earliest days when Joseph Henry established his global network of correspondents and have increased over time. The Institution's international activities occur at many levels, from informal scholar-to-scholar correspondence to highly structured institutional undertakings. The current staff associated with the Office assists in facilitating these undertakings.

International Center Programs - The wide range of continuing Smithsonian international interests forms the core subject matter for programs of the International Center in the Quadrangle complex. The International Center provides a venue for discourse and exhibition on a wide array of international topics. A major objective of the Center is to put scholarly inquiry at the service of the general public's desire to understand a changing international scene and, in so doing, to focus not merely on contemporary concerns but place them in historical context. Programs in the International Center include exhibitions, conferences, colloquia, performances, film showings, lecture-discussion meetings, seminars, symposia, and intensive workshops.

"Generations," a multidisciplinary, multicultural investigation of the art and rituals associated with birth from ancient times to the present celebrated the opening of the International Center in September 1987. It links many diverse Smithsonian scholarly resources and collections to explore the richness and diversity of cultures worldwide as they celebrate this milestone of the human experience. Of particular importance in the exhibition is the interpretation of non-Western materials in context, through concentration on the ways certain cultures view this subject, how they incorporate it in their world view, how they deal with its reality as well as its symbolism, and how they express these ideas and concepts in material form.

A series of related public forums in FY 1988 entitled "Face to Face with the Next Generation" will allow for the further examination of issues that have a direct bearing on the future education, health, and social well-being of children throughout the world. Leading experts from around the world will be convened to share with each other and with public audiences their insights and concerns about how critical problems and issues of today likely will affect new generations tomorrow. Other activities planned to complement the "Generations" exhibition include film festivals and special programs for families.

A second major exhibition, "Tropical Rainforests: A Disappearing Treasure," organized by the Smithsonian Institution Traveling Exhibition Service, will open in May of 1988. This show again allows the Smithsonian to present the results of scientific research, much of which has been undertaken by its own staff, on the destruction of the world's tropical forests, the Earth's most biologically diverse habitat. The exhibition will address this timely and vital problem with a cross-disciplinary approach and will draw extensively upon the research conducted at

the Institution's Tropical Research Institute, the Museum of Natural History, and the National Zoo as well as other international research centers. The goals of this exhibition are to alert the public to the problems confronting tropical ecosystems, especially forests, and to illustrate current programs in research, conservation and sustainable use, that are addressing the issues of tropical deforestation.

To derive the maximum public educational potential of the exhibition, the Institution will sponsor a parallel series of scholarly and public programs. The programs are an integral part of the tropical forest exhibition because they will provide more in-depth information on a variety of topics that are too complex for, or otherwise not easily translatable into, a museum exhibition. The programs will assume three different formats -- film series, public lecture series, and scientific symposia and seminars -- and will be designed to appeal to a wide audience. This programming, developed for use at the Smithsonian, will also serve as a template for programming for the traveling exhibition version scheduled to be presented in 12 other museums.

In 1986 the Office, in cooperation with the National Museum of Natural History and the Man and the Biosphere-UNESCO Program, undertook development of a new international program on biological diversity inventory procedures. The program was designed to develop a high resolution data base management system that will provide, in time, nearly complete biological inventories of selected species-rich sites such as Biosphere Reserves, National Parks and Reserves, and other protected areas of developing countries. (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.) With such a methodology, comparative work can proceed more efficiently and accelerate the pace of understanding the scope and scale of biological diversity in the world.

One of the most important aspects of this new program is the training of biologists and other related professionals from developing countries so that they can conduct their own biological inventories and assist in cataloguing bioresources within their respective countries. As a first step, with support from the United States Agency for International Development, the World Heritage Program of UNESCO and the Man and the Biosphere - UNESCO Program, field training workshops were conducted in 1987 in the Beni Biosphere Reserve in Bolivia and in the Manu Nature Reserve in Peru. Twenty Bolivian and 32 Peruvian participants were trained in the field in the methodology of conducting biological inventories. Negotiations are presently under way with other national and international organizations to expand the program within Peru and Bolivia and also to other Latin American countries and abroad. Within the Institution, the program complements the Biological Diversity in Latin America Program (BIOLAT), a research initiative of the National Museum of Natural History.

Support Services for Smithsonian International Programs - The Office of Service and Protocol provides the basic services necessary to coordinate the international aspects of Smithsonian research and museum programs, such as obtaining passports and visas for Smithsonian travelers, facilitating communications and logistical arrangements for research and participation in meetings abroad, assisting in the drafting and implementing of agreements relating to international cooperative programs, providing assistance to foreign dignitaries and scholars who participate in Smithsonian programs in the United States, and compiling and updating the "Summary Profile of Smithsonian International Activities."

The Office of Publications Exchange fosters 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. In recent years, more than 200 American universities, libraries, and other organizations have participated in this international publications exchange. During FY 1987, it is expected that more than 90,000 volumes will be exchanged.

Special International Programs - During the next five years, the attention of the Smithsonian and, indeed, the Nation will become increasingly focused on the commemoration of the 500th anniversary of Christopher Columbus' 1492 voyage to the Americas. For the Smithsonian Institution, this occasion offers an opportunity to take a closer look at the past, present, and future implications of this anniversary. The Institution has promoted the development of a centrally coordinated, pan-Institutional Quincentenary program that will reflect the diversity of Smithsonian research interests and provide the general public with the broadest understanding of the significance of the Columbian voyage. In the spring of 1988, the Institution will sponsor a scholarly symposium entitled "Explorations, Encounters and Identities: Musical Repercussions of 1492." The all day symposium will be attended by teachers, professors, students, and the interested public. Public programs based on the symposium are planned for subsequent years. The planning for future symposia related to the Quincentenary (to be held in FY 1989) continued in FY 1988.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided by allotments which support planning and development of research and exhibition programs for the International Center and for administration of the Quincentenary Commemoration. A special purpose fund provides stipend support for international scholarly exchanges aimed at strengthening the Smithsonian's institutional linkages.

Restricted Funds - These funds are provided from gifts, grants, and other donations from individuals, foundations, organizations or corporations for specific purposes, such as mounting exhibitions and staging performances, film showings, and other public presentations in the International Center.

AMERICAN STUDIES AND FOLKLIFE PROGRAMS

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	12	764	12	572	-	87	-	69	-	530
FY 1988 -Estimate	8	794	14	854	-	79	-	440	-	1,499
-Base	8	801								
FY 1989 Estimate	10	912	14	795	-	68	-	499	-	1,729

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	8	2	10
11 Personnel Compensation.....	382	37	419
12 Personnel Benefits.....	55	7	62
21 Travel.....	18	9	27
22 Transportation of Things.....	5	-	5
23 Rent, Communications & Utilities.....	20	-	20
24 Printing & Reproduction.....	60	7	67
25 Other Services.....	201	47	248
26 Supplies & Materials.....	40	4	44
31 Equipment.....	20	-	20
Total	<u>801</u>	<u>111</u>	<u>912</u>

Analysis of Increase

Necessary Pay.....	7
Program Funds.....	104

ABSTRACT - The Office of American Studies and the Office of Folklife Programs are engaged in the study of various aspects of American society. The Office of American Studies seeks to advance knowledge in the field of American material and folk culture by individual staff research and by conducting a program in which graduate students are encouraged to advance knowledge through their own research. Dissemination of the knowledge thus advanced is accomplished through teaching, lecturing, and publication of the results of that research. The Office of Folklife Programs performs research

on, prepares publications about, produces performances of, and strives to conserve living folklife traditions. For FY 1989, an increase of 2 workyears and \$104,000 is requested to provide staff and related support for Folklife archival holdings (2 workyears and \$54,000), and to continue preparations for the commemoration of the Quincentenary in 1992 of the Columbus Expedition (\$50,000). Necessary pay of \$7,000 is requested for existing staff.

PROGRAM - I. The Office of American Studies: With base resources of 2 workyears and \$106,000, the Office of American Studies sponsors a graduate program in American material culture in cooperation with various universities located in the Washington, D. C., area and in other cities. Three or four seminars a year are offered for academic credit and are taught by the director of the program and by cooperating scholars.

The graduate program in American material culture provides a means for scholars and students to pursue American studies utilizing the unique resources of personnel, objects, manuscripts, and books available in various bureaus of the Smithsonian. It provides opportunities for graduate students in American studies or American history departments of affiliated universities to undertake a program of formal course work at the Institution.

II. The Office of Folklife Programs: With base resources of 6 workyears and \$695,000, the Office of Folklife Programs engages in the study, exhibition and conservation of Folklife traditions. The most visible result of these endeavors is the annual Festival of American Folklife which, since its inception in 1967, has drawn an estimated 15 million visitors. The Festival has proved to be an educational and enjoyable opportunity for the public to learn about American and foreign cultural traditions. In addition to sponsoring the Festival, the Office serves the members of traditional cultures by providing national recognition to their traditions, maintains an archive of traditional performances and cooperates with government agencies to advance the Nation's interest in folklife.

Research and Publications - The Office is currently engaged in, or has completed, research projects on Michigan folklife, Massachusetts folklife, Washington, D.C. folklife, the traditions of the elderly, diverse American linguistic communities, the Ojibwa wild rice culture, Great Basin music, Appalachian flat foot dancing, traditional Mexican bread making, African epics, Indian festivals and puppetry traditions. The results of this research are disseminated through the award winning annual Festival program book, articles in journals, books, films, radio programs, scholarly presentations and the Smithsonian Folklife Studies Series. The Folklife Studies Series (which couples monographs and documentary films) has in FY 1987 released "The Korean Onggi Potter." Other recently completed projects include a monograph on the Ojibwa, a booklet on Indian fairs and festivals, a radio series on American musical traditions, and an Academy Award winning film on Italian-American stone carving. The Office has been given editorial responsibility for the Institution's recently acquired Folkways Records collection. Planning for the establishment of consultative boards and editorial procedures is currently under way. The Institution's acquisition of Folkways records represents an unparalleled opportunity to develop research, publications, and outreach programs that educate a broad public to the richness and variety of folk and traditional music, narrative and historically significant oratory.

Exhibitions - The Festival of American Folklife, which has evolved into the largest annual cultural event in the Nation's Capital, has stimulated interest in and

provided a model for the research and presentation of traditional cultures. Currently, the Office is working on Festival projects with Michigan, Massachusetts, Hawaii, Vermont, New Mexico, Puerto Rico, northwestern and midwestern states, and with the nations of China, Pakistan, India, Indonesia, Canada, the Soviet Union and the Arab Gulf States.

In FY 1987, the 21st Festival featured the traditions of Michigan, the traditional music of the District of Columbia, and the cultural conservation of American language traditions. The Festival, which drew approximately one million visitors, generated massive media attention and critical acclaim. In FY 1988, the Festival will feature the traditions of Massachusetts, the role professional folklorists have played in the conservation of traditional cultures (in order to mark the centennial of the American Folklore Society), and the second of a continuing series on the folklife of the District of Columbia. Also planned are a musical program from the Soviet Union and one on Folkways Records artists.

The Office has provided curatorial leadership for "The Grand Generation," a Smithsonian Institution Traveling Exhibition Service (SITES) exhibit opened in November 1987, which, based upon a previous Festival program, highlights the role of the elderly in preserving and promulgating cultural traditions. The Office has also provided curatorial support for "Generations," the inaugural exhibit for the International Center.

Archives and Education - The current Office archives holds approximately 15,000 audio tapes, 1,000 videotapes, 400,000 photographic images, 500,000 feet of motion picture film and over 10,000 paper files encompassing the research, documentation and presentation of thousands of folk cultural traditions from all parts of the United States and some 45 countries. Highlights include materials on occupational folklife, family folklore, American musical traditions, narratives, ethnic and American Indian performance traditions.

The archives are invaluable in handling scholarly inquiries and general informational requests. In addition, the archive is a valuable resource for those conducting research. In FY 1987, the resources of the archives were utilized by visiting fellows conducting research on such topics as the creation of cultural identity in public festivals, Hispanic performance, Black American narrative, Indian folk culture and Italian-American traditions. The Office is in the process of accessioning the Moses and Frances Asch Archives, a collection of materials compiled over the 40-year history of Folkways Records. Comprised of field records, ethnographic documentation and notes, early phonograph records and correspondence, among other things, the archives will be a rich source of data for future researchers, and for the development of musical and cultural educational materials.

EXPLANATION OF PROGRAM INCREASE:

Office of Folklife Programs: Folklife Program Archives Staff and Support costs (2 workyears and \$54,000). For FY 1989, an increase of 2 workyears and \$54,000 is requested to hire an archivist and archives assistant and to begin audio tape preservation and automation of research interview data.

The archives are an essential part of office operations and are used for research purposes by Office staff, Smithsonian fellows, outside scholars and students, and the interested public. The requested increase will meet three needs that currently threaten the continued and optimum use of archives. First is the need for a permanent

archivist on staff. Second is the need to copy onto a stable medium documentary materials which are physically decomposing. These irreplaceable materials are in danger of being lost forever. Third is the need for greater accessioning and cataloging efforts, which have not been able to keep pace with the growth of archival materials, documents, tapes, photos, and field research reports.

The re-recording of research interview data originally recorded on aging acetate-backed tapes will preserve this scientific, cultural and historical information on tapes with a much more durable backing. In addition, more than 12,000 Office-generated ethnographic report forms on contemporary folk artists will be entered into computer database files. This will increase accessibility and usefulness of this data to scholars and will form the kernel from which a cross-indexed information retrieval system for all archival materials will grow. The increased support will also accelerate the rate at which new documentation is accessioned, indexed, and, in appropriate cases, copied and sent to state archives.

At present, the archives are supported on a temporary basis subject to the availability of lapsed salary and other funds. The importance of this documentation suggests that its maintenance and development as a research resource be placed on a permanent basis. The requested increase will allow Folklife to hire two positions and provide for contracts and supplies for conservation and data entry, and preserve the unique historical and cultural materials and a nationally important data base for folkloristic scholarship.

Columbus Quincentenary Project (\$50,000) - For FY 1989, an increase of \$50,000 is requested to continue initiatives begun in FY 1987 for the Columbus Quincentenary. Added to base funds received in previous years, which support research, clerical support, meetings of an advisory board of scholars and administrative travel, the increase will support the contractual services of an editor and folklorist, costs associated with additional research and printing, and partial support costs for symposia.

The Office has been assisted by its advisory board of distinguished scholars in planning a Quincentenary project particularly suited to the Office's and Institution's research strength and development. The project explores the cultural consequences of the cultivation and use of historically important crops associated with the historic encounter of civilizations begun by Columbus. A series of symposia, "living museum" exhibitions, films, publications and sound recordings will examine the cultural and social systems within which selected food and cash cropping systems were embedded, with particular attention to the traditional, expressive and aesthetic forms associated with those cropping systems.

Three symposia topics, "The Seeds of the Past," "The Seeds of Commerce," and "The Seeds of Industrialization," will be the subject of an exchange of research results and analyses among scholars from throughout the Western Hemisphere. The symposia will result both in a published anthology and the plans for "living museum" exhibitions to be mounted at the Smithsonian in 1991 and 1992. The project will be based on several forms of collaboration with foreign scholars and institutions, from program planning to exhibit design and implementation; and, finally, to the development of ancillary outreach vehicles to ensure the broadest possible diffusion.

In FY 1989, the requested increase will support the second scholarly symposium of the series, entitled "The Seeds of Commerce." This will focus on the cultural consequences of crops such as sugar and tobacco which were the object of significant

pre-industrial trade between Europe and the Americas. The increase will also enable the Office to collaborate with research institutions in Caribbean countries in support of a subsequent symposium on the same topic to be held in the Caribbean. The results of these scholarly meetings will be compiled and published. The requested increase will support research for "living museum" exhibitions in 1991 and 1992 and for a publication in the Office's monograph/film series.

Provision of these funds will allow the rational and timely development of the Office's Columbus Quincentenary projects and will preserve collaborative ties with scholars and institutions in Latin America and the Caribbean.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds: I. Office of American Studies: Tuition reimbursement is received from the cooperating universities, principally the George Washington University and the University of Maryland, whose graduate students avail themselves of the courses offered by the Office of American Studies. The tuition reimbursement is designed to reimburse the Smithsonian for the use of its facilities by the students participating in Smithsonian classes and, in addition, to provide honoraria and reimbursement for the services of outside experts participating in the program.

II. Office of Folklife Programs: Funds are provided by allotments and from concessions relating to the Festival of American Folklife. These funds support the salaries as well as related support costs. Funds for workshops on the folklife of the elderly, the dissemination of Asian-American documentation, a lecture series on South African cultures and D.C. community inreach have also been available from the Institution's Educational Outreach Program and Special Exhibition Program.

Restricted Funds - Funds are provided in the form of individual gifts and grants from private foundations and corporations and are used to fund specific programs or components. Funds in FY 1987 provided partial support for the Metropolitan Washington, D.C. Music program and the narrative component of the Michigan program at the Festival of American Folklife.

Government Grants and Contracts - These are provided by various state and local governments for support of performances and programs at the annual Festival. In FY 1987, funds were received to support the costs of highlighting the folklife traditions of the State of Michigan. Research and presentation of Massachusetts folklife at the 1988 Festival are made possible by a grant from the Commonwealth of Massachusetts.

INTERNATIONAL ENVIRONMENTAL SCIENCE PROGRAM

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	10	714	-	-	-	-	-	-	-	-
FY 1988 -Estimate	13	750	-	-	-	-	-	-	-	-
-Base	13	754								
FY 1989 Estimate	13	757	-	-	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	13	-	13
11 Personnel Compensation.....	226	2	228
12 Personnel Benefits.....	30	1	31
21 Travel.....	102	-	102
22 Transportation of Things.....	2	-	2
23 Rent, Communications & Utilities.....	5	-	5
24 Printing & Reproduction.....	14	-	14
25 Other Services.....	261	-	261
26 Supplies & Materials.....	85	-	85
31 Equipment.....	29	-	29
Total	<u>754</u>	<u>3</u>	<u>757</u>

Analysis of Increase

Necessary Pay..... 3

ABSTRACT - The International Environmental Science Program (IESP) is a multi-bureau, interdisciplinary effort to coordinate the Institution's long-term monitoring and study of unique and significant ecosystems. The goal of the Program is to evaluate and eventually predict the impact of human activities and natural change on selected ecosystems. Research sponsored by the IESP occurs at two permanent Smithsonian sites--the Tropical Research Institute in Panama and the Environmental Research Center in Maryland--as well as at several non-permanent sites throughout the world. No program increase is requested for FY 1989. Necessary pay of \$3,000 is required for existing staff.

PROGRAM - The International Environmental Science Program sponsors research to meet the urgent need for long-term studies of the world's ecosystems, especially in tropical and subtropical regions where the rapid rate of tropical deforestation, loss of suitable soil and resulting threat to wildlife are of critical importance. The Program provides funds for teams of scientists to monitor natural variations in specific environments that are still unstressed by humans. Recent United States Government and international commissions have reemphasized the need to expand long-term monitoring activities to gain further insight into biological diversity and to assist in the survival of rapidly disappearing ecosystems.

Permanent IESP research sites are maintained at the Rhode River Estuary at Edgewater, Maryland; the tropical lowland forest of Barro Colorado Island (BCI); and the Galeta Reef on the Atlantic side of the Panama Canal. For over ten years, scientists have developed a data base on the biological, physical and chemical components of these ecosystems. Analyses of this data have produced concepts and verifiable hypotheses on the long-term patterns in climate, and the stresses and disturbances resulting from human activity.

Research sponsored by the IESP is also conducted at non-permanent sites in Aldabra, Nepal, Venezuela, Brazil, and Amazonian regions of Peru and Bolivia. Smithsonian scientists, with support from the host governments, are continuing their efforts to gather descriptive data at these sites that will aid in the development of verifiable hypotheses concerning genetic diversity, animal management, and natural area management.

Highlights of recent IESP research accomplishments at the Program's permanent and non-permanent sites for FY 1987 are summarized below:

Edgewater, Maryland - In order to assess the impact of acid rain on eastern coastal plain hardwood forests, a detailed acid budget was measured over a 4-year period for a mature forested drainage basin. Precipitation was primarily a dilute solution of nitric and sulfuric acids while the stream water draining the basin was primarily a solution of magnesium, calcium, sodium and potassium sulfates and chlorides. The differences between inputs from acid rain and stream exports reflect the nearly complete retention of ammonium, hydrogen, and nitrate ions; the partial retention of sulfate; and a net loss of metallic cations such as potassium and calcium from the watershed. The watershed ecosystem neutralized 98 percent of the acidity in precipitation, but the remainder was sufficient to acidify the stream draining the forest. All of the nitric acid from acid rain is retained by the ecosystem without detrimental effects upon the forest or stream. Sulfuric acid was the acidic pollutant responsible for the cation losses and stream acidification.

The changes in acidity of forested streams were more related to changes in precipitation acidity over time than were the changes in acidity of agricultural streams, reflecting the importance of other major terrestrial sources of acidity on agricultural systems. Surges in acidity and dissolved aluminum concentration in primary streams reached extremes of pH 3.2 and 300 ug Al per liter. Larger streams were also observed to have surges in acidity with pH minima below 5.0. Surges in acidity occurred during accelerated groundwater percolation following storm events and did not coincide with surface runoff or snowmelt. These acid surges and aluminum concentrations are highly toxic to aquatic animals, especially during their larval stages.

One of the limiting factors for productivity in Chesapeake Bay is sunlight penetration. A year-long study of incident sunlight and underwater light penetration in a tidal tributary to Chesapeake Bay found that both the intensity and color of penetrating sunlight responded to changes in the concentration of suspended soil particles and phytoplankton. Light attenuation was higher in the upper part of the water column under sunny, clear skies than on cloudy days. This was due to higher concentrations of pigments and suspended particles in the water on sunny days and the diffuse character of sky light on cloudy days. Thus, even though incident sky light is much less intense on cloudy days, this sky light is not attenuated as rapidly in the water column. Therefore, productivity is not as limited by low light intensity on these cloudy days as previously believed. Variation in eight water quality parameters explained up to 93 percent of the variation in the light attenuation. Chlorophylls a and c and mineral suspensates were the three most important variables for light attenuation under clear skies. These results allow us to calculate underwater light intensity and color in the Chesapeake if sky conditions and selected water quality factors are known.

Panama - IESP funded research on Barro Colorado Island has provided important new information on how water and light control forest structure and productivity, information of major significance to the development of techniques for agroforestry and reforestation. The BCI forest irrigation project is entering its third year. Experimental elimination of soil drought stress over the past two dry seasons has yielded fundamental insights into forest dynamics. Although several plant species showed altered patterns of growth and reproduction in response to irrigation, many did not. Thus, factors other than soil moisture, such as relative humidity and day length, are also influencing phenological patterns -- a result of importance for applied forestry programs. Use of new computer image processing technology (largely funded by IESP) to analyze photographs of the forest canopy has resulted in a major breakthrough in the analysis of the forest light environment on BCI. A precise and accurate description of under story light environment has been developed, permitting analyses of responses of forest plants to light on a spatial and temporal scale never before attempted. This provides information necessary for management programs that improve growing conditions for economically important forest tree species.

Long-term monitoring of reef and mangrove communities is continuing at Galeta, providing invaluable background for analyses of the impact of the April 1986 oil spill on these areas. These IESP funded studies are now being supplemented by a \$3 million five-year contract to STRI from the Minerals Management Service of the Department of the Interior. This contract was awarded because of the unequalled biological record provided by IESP at Galeta, and because this basic monitoring will be continued in the future.

Aldabra - Continued surveys of the flora and fauna of the atoll were carried out by a team of seven scientists. A further 20 quantitative samples were taken in sea grass beds for analysis of infaunal composition. A survey of eight limestone sinkholes on Picard Island was initiated. Qualitative and quantitative sampling plus measurements of tidal range, water temperature and salinity, and physiological tolerances of some of the common shrimp species will be combined to explain anomalous distribution patterns in the sinkholes. Collecting of terrestrial fossils doubled the number of extinct bird species: a shearwater, hawk, booby, and gull were recorded. Pleistocene-Holocene land molluscs were collected from previous sites plus several new ones. This will supplement the Smithsonian collections. A few new taxonomic records occurred. Polychaete worm studies included collecting in rubble for eight or nine

species being surveyed for variability in mangrove algal mats for a quantitative characterization of the benthic community and in the limestone sinkholes for part of a worldwide taxonomic study of fabriciine worms. The marine isopod survey was continued with ten stations in a variety of habitats. Numbers of rare species in the collection were increased, and several new species discovered.

Nepal - The major achievement of the IESP funded Smithsonian-Nepal Terai Ecology Project was the translocation of nine one-horned Asian rhinoceros from Royal Chitwan National Park to Royal Bardia Wildlife Reserve. This event brought the total number of translocated rhinos to 13 and allows for better management of this highly endangered species in another favorable habitat, thereby improving survival chances. The Chitwan population is the best studied population of these endangered mega-mammals, and new findings coming to light will be used to improve management of the rhinoceros and its habitat. Recent findings show the rhinoceros to be a major "landscape architect," whose effect on the habitat is pronounced and long-lasting. In addition, it was found that the breeding male population undergoes a high rate of turnover, which augurs well for maintaining the genetic variability of the population.

Venezuela - A total of seven research projects were conducted at the field site at Hato Masaguaral, Venezuela. Research on the red howler monkey continued to focus on the relative importance of demography, kinship and dominance on the social interactions within groups of this species. The social groups selected for this study included newly formed groups, groups with long-term stability of adult male membership and groups with rapid turnover of adult males. Observations of these groups also enabled the investigation of the influence of newly formed groups on the ranging patterns of long established groups. In addition, 75 individuals of the population were immobilized and marked this year and milk samples were collected for nutritional analysis from 15 lactating females. This is the first time that such analyses have been undertaken for any free living New World primate species. Currently large cages are being constructed at the field site to house a group of red howlers for detailed studies on the nutritional aspects of the diet of this species. As with red howlers, the field investigations on Cebus monkeys (which is in its tenth year) dealt with the determinants of social interactions in groups with known genealogy and demography. The long-term studies on the two monkey species provide the most complete and detailed investigations on any population of sympatric primates found in South America.

The research on the Snail kite, a bird which is listed as endangered in the United States, focused on polygamy in this species and the details of its unique patterns of mate desertion behavior; i.e., if snails are abundant, either parent may desert its mate about halfway through caring for the young and may find a new mate and re-nest. Brood manipulation experiments are now being conducted to determine if the sizes of broods have an effect on mate desertion behavior of males and females.

The other four research projects conducted in Venezuela include studies on caimans, hoatzins (an avian leaf eater), white-tailed deer and two local bird communities.

Brazil (Golden Lion Tamarin Project) - During FY 1987, scientists have been closely monitoring the released golden lion tamarins at two sites in Brazil (Poco das Antas Reserve and Pesagro, an agricultural station). Three groups, totaling eight animals, remain from the original animals released in FY 1984 and FY 1985. A total of three litters has been born to released tamarins, from which three young survive. Major causes of death of released animals include predation and disease. An analysis of survivorship has revealed that younger animals survive better, especially if

reintroduced within their family group. Techniques for training captive-born golden lion tamarins in the wild have been developed to test if the release program can be made more cost effective. In FY 1987 and FY 1988, scientists plan to release four untrained family groups on non-Reserve property, thus (1) involving local landowners directly in conservation and (2) making Smithsonian preparation and training techniques more cost effective. Other studies of wild golden lion tamarins continue. Although the vast majority of groups appear to contain a monogamous breeding pair, there are instances of polygyny and polyandry. Monitoring is intended to continue on the wild population so that scientists can characterize the age and sex structure of the species as well as the dispersal patterns of young over the long term. It is planned to test theoretical predictions concerning the genealogical relationships of adults that assist in rearing young to determine if "helpers" help due to kin selection or reciprocal altruism. Researchers are continuing the genetic analysis of the tamarin population in the wild and captivity and have initiated a survey of small mammal densities and distribution, a study of tamarin energetics, and an investigation of feeding ecology, diet, and nutrition in golden lion tamarins. Activities in conservation education continue with the reevaluation of local attitudes towards conservation issues now being analyzed to determine if, and which, educational materials have an impact on the attitudes and awareness of the local community. A manual for conservation education programs is being developed and a workshop will be held for park and reserve education personnel. Additionally, scientists continue to monitor and protect the condition of this very endangered habitat with its unique fauna through the control and regulation of hunters, squatters, and fire. During FY 1987, considerable activity centered on identifying additional suitable habitats for tamarins on private land where tamarins could be released.

Brazil (Neotropical Lowland Research Project) - Field and laboratory work on the Amazonian and Atlantic Forest biota was done in Archeology, Botany, Entomology, Fishes, Herpetology, Birds and Mammals. Results of these investigations added important new information on the composition and distribution of the Neotropical biota. These data are important for completion of several major publications and conservation planning. Specific highlights during the past year include the holding of an "International Workshop on Neotropical Distribution Patterns," co-sponsored by the Smithsonian Institution and the Academia Brasileira de Ciencias with additional support provided by the National Science Foundation and the Conselho Nacional de Desenvolvimento Cientifico es Tecnologico. Six papers by Smithsonian participants were given at the scientifically rewarding workshop. At the invitation of the Academia Brasileira de Ciencias, a multi-disciplinary team of Smithsonian aquatic entomologists, herpetologists, ornithologists, and mammalogists made a preliminary intensive formal survey of a proposed dam site on the Rio Xingo. Based on study of the collections, conservation recommendations were forwarded to the appropriate Brazilian agencies.

Evaluation of Program - The International Environmental Science Program is involved in an ongoing process of evaluation to ensure the quality of the research. The IESP programs regularly are subject to peer reviews. In FY 1987, participants in the Brazil (Amazon) project met in Rio de Janeiro for an international meeting to share research results to date. These efforts were critiqued by a group of internationally distinguished scientists, and will form the basis for a new book. The meeting also served to frame research priorities for this project over the next five years.

Over the next five years, it is anticipated that work will continue at all Program sites. Selected new initiatives will be undertaken in the future to improve

the Institution's capabilities in monitoring additional subtropical and tropical sites. The loss of habitat in these areas makes it essential that scientific data be gathered now on areas that may disappear, and to assist in developing plans to conserve other areas before they are lost.

ACADEMIC AND EDUCATIONAL PROGRAMS

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	16	854	11	624	-	1,784	-	201	-	-
FY 1988 -Estimate	22	976	11	708	-	2,004	-	146	-	-
-Base	22	987								
FY 1989 Estimate	23	1,093	11	740	-	2,009	-	95	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	Base FY 1988	Proposed Adjustments	Est. FY 1989
FTE Allocation.....	22	1	23
11 Personnel Compensation.....	623	38	661
12 Personnel Benefits.....	104	15	119
21 Travel.....	17	3	20
22 Transportation of Things.....	1	-	1
23 Rent, Communications & Utilities.....	8	1	9
24 Printing & Reproduction.....	62	10	72
25 Other Services.....	125	38	163
26 Supplies & Materials.....	27	1	28
31 Equipment.....	20	-	20
Total	<u>987</u>	<u>106</u>	<u>1,093</u>

Analysis of Increase

Necessary Pay.....	18
Program Funds.....	88

ABSTRACT - Research and education are among the principal objectives of the Smithsonian. To attain these goals, the Institution promotes scholarly and academic ties with other learned institutions and offers its resources to the general public as well as the academic community. Scholarly and academic ties are developed and maintained through competitive awards for research projects, programs in higher education, symposia and seminars, and learning opportunities at the elementary and secondary school levels. Included in this line item are the Office of Fellowships and

Grants, the Office of Interdisciplinary Studies, the Office of Elementary and Secondary Education, and the National Science Resources Center.

For FY 1989, an increase of 1 workyear and \$88,000 is requested to provide expanded support for ongoing seminar series; to support the development of educational materials for preschool teachers and students in commemoration of the Columbus Quincentenary; and to establish and maintain the teaching resource collection and data base at the National Science Resources Center (NSRC). Necessary pay of \$12,000 is required for existing staff, along with .25 workyear and \$6,000 required to annualize the partial year funding of 1 new position approved in the FY 1988 budget.

PROGRAM - I. The Office of Fellowships and Grants - With base funding of 9 work-years and \$347,000, the Office of Fellowships and Grants (OFG) manages Smithsonian Fellowships, other stipend appointments and various programs which support research, foster communication and collaboration between the Institution and universities, museums and research centers situated in the United States and abroad, and ensure the full use of Smithsonian resources. The collections and facilities of the Smithsonian, as well as the curators and scholars who use them, provide unparalleled and essential resources for specialized study. The various forms of financial support offered by the Institution provide greater access to these resources and thereby provide a unique complement to university scholarship. Fellowships and other awards, which are supported primarily with Trust funds, enhance research in all areas of the Institution and promote interdisciplinary projects among bureaus.

The Office of Fellowships and Grants administers a number of programs that enable students and scholars to visit the Institution. In FY 1987, 99 predoctoral and postdoctoral fellows received awards through an Institution-wide program. Twenty-one of these recipients were foreign students and scholars from 13 countries. Under the Short-Term Visitor Program, 185 appointments were made with funds allotted to OFG to allow visitors to come to the Institution, for periods ranging from a few days to several weeks, to work in collaboration with the research staff. This program strengthened the Institution's international ties, with 89 participants representing 33 foreign countries. In addition, fellowships were provided with Trust and Federal funds designated to the bureaus for specific purposes. The Regents Fellowship program continued to bring eminent scholars to the Institution. In FY 1987, three Regents Fellows began their residencies. Several senior fellowships also were awarded using bureau funding. The Office manages the James E. Webb Fellowship, which promotes excellence in the management of cultural and scientific not-for-profit organizations. In FY 1987, one person from within and one person from outside the Institution were awarded fellowships to allow them to pursue and enhance their specific administrative goals. The Office of Fellowships and Grants also administered stipends for Smithsonian Internships to 136 students in FY 1987.

Programs of research support are available to Smithsonian staff through the Office of Fellowships and Grants. The Scholarly Studies Program provides awards on a competitive basis to fund research projects of particular merit and promise which are not readily accommodated through the Federal process. Thirty awards of one- and two-year duration were offered for individual and team investigations in FY 1987. Some of these awards involved scholars from other institutions. The Workshop Program also provides funding to Smithsonian staff to enable them to organize and support workshops, seminars, and symposia which draw together scholars worldwide to discuss a variety of specific subjects. In FY 1987, eight activities of this kind were wholly or partially supported with these funds.

A number of programs designed to increase minority participation in Smithsonian opportunities for research and study are administered by the Office. Thirty-one students participated in the minority internship program. In addition, two minority students were provided funding through the Cooperative Education Program, and two minority students were offered Education Fellowships. Both programs strive to promote increased minority representation in the professional research staff of the Institution. The Native American Awards Program, which facilitates access to Smithsonian Native American collections and resources, provided appointments to six Native American students and scholars. The Visiting Associates Program, designed to introduce the Smithsonian to academic faculty and administrators committed to furthering minority education, held two five-day sessions to disseminate information about the Institution's research activities and support opportunities. This year one award was provided through the Faculty Fellowship Program to a minority faculty member. One past Faculty Fellow from Howard University together with another faculty member introduced eight undergraduates from Howard to tropical biology by organizing a field course that was conducted at the Smithsonian Tropical Research Institute. The course was funded through the Smithsonian Educational Outreach Program.

II. The Office of Interdisciplinary Studies (OIS) - With base funding of 3 workyears and \$102,000, the Office changed its name from the Office of Smithsonian Symposia and Seminars to communicate more clearly its mission: exploring gaps in knowledge and delivering new results of scholarship in the physical, natural, and human sciences and the humanities, for the purpose of strengthening integrative learning inside and outside the Institution. The interdisciplinary approach is a holistic, inclusive one, whose importance is receiving growing recognition. The Office seeks to demonstrate that increasing and diffusing knowledge, the terms of the Smithsonian's mandate, are interdependent parts of the same process.

The Office continues to regularly convene scholars and other specialists at major symposia in the Smithsonian's international symposium series, at seminar series, and special programs, all of which focus on themes of current significance and public interest. These programs, usually undertaken with the collaboration of other research and professional institutions along with staff and bureaux around the Institution, are intended to improve access of the practitioners, patrons, and users of research to one another and thereby encourage the flow of ideas. The Office produces books and educational materials based on these scholarly programs. It also serves as a Smithsonian link with partners in the world of higher learning, acting as a resource center for visiting scholars and students and representing the Smithsonian at national and international meetings and commemorations.

Of major importance in FY 1987 was the ninth international symposium, "Constitutional Roots, Rights, and Responsibilities." The five-day program, the scholarly centerpiece of the United States' observance of the Bicentennial of the Constitution, brought together 68 participants from 12 countries. Discussed were such topics as the origin of written and unwritten constitutions; the development of the Supreme Court doctrine on civil rights and changes in Constitutional interpretation; the origin of rights; the status of state constitutions and American Indian constitutions; the comparison of national constitutions; the influence of technology on government; the impact of Supreme Court decisions on women and minorities; and the interplay of rights and responsibilities in a democracy. Large audiences were in attendance; part of the proceedings were broadcast nationwide by C-Span and overseas by the Voice of America and Worldnet. Essays will be published in a forthcoming volume. In addition to the symposium volume, the Office will produce a one-half-hour video documentary for high school students entitled "Rights at Risk: The Responsibilities of Citizenship."

The Office is preparing another program to observe the Bicentennial of the Constitution, "Afro-Americans and the Evolution of a Living Constitution." It is scheduled for March 1988, and will be organized in conjunction with the Joint Center for Political Studies. This symposium will address the impact that Afro-Americans' search for full citizenship has had on Constitutional law in the 19th and 20th centuries and its influence on other domestic groups.

"Creativity in the Arts and Sciences" was the theme of the September 11, 1987, symposium celebrating the opening of the Arthur M. Sackler Gallery. Held at the National Academy of Sciences, under Smithsonian auspices, the symposium featured such scientists as Linus Pauling, Smithsonian Regent Murray Gell-Mann, Chen Ning Yang, Jonas Salk, Solomon Snyder and Donald Frederickson and such performing artists as Janos Starker, Rosalyn Tureck and Byron Janis. The encounters stimulated dialogues intended to answer questions about the biological, social, and environmental bases of creativity, and threw new light on giftedness in both the young and senior citizens. The late Dr. Sackler was helping to plan the symposium at the time of his death. A film portrait of Dr. Sackler, excerpted from the TV series, "Smithsonian World," started the symposium.

A new program has been launched specifically to foster a stronger sense of intellectual community among Smithsonian professional staff, recognize strengths and convergences of interest not immediately apparent in a specialized environment, and bring predoctoral and postdoctoral fellows more into the life of the Institution. This intramural seminar series, "Ways of Knowing," responds to the staff's expressed need for forums through which they can exchange ideas and methodologies and debate issues in a "neutral" (i.e., trans-departmental and bureau) setting. The first seminar was held in October 1987.

The Office has begun consultation in various parts of the United States and abroad for ideas to be incorporated in the 1992 symposium, "Exploring the Unknown," as part of the Smithsonian's commemoration of the Columbus Quincentenary. These include Native American research and education institutions.

The Smithsonian will cooperate in two major scholarly events in 1987-1988. A November 1987 workshop addressed science policies affecting research on exceptional abilities, under auspices of the Institute of Noetic Sciences, Sausalito, California. "The Heritage of Tyre" will be the focus of a symposium on the archaeology of that ancient city in Lebanon in 1988. The American National Committee for Tyre will sponsor the symposium with the cooperation of the Smithsonian, the American Schools for Oriental Research, and the Council for Overseas Research Centers.

To better understand American society in a world context--particularly United States' communications problems with other cultures--the Office is planning a series of seminars, "Research on Contemporary Cultures and Civilizations," to start in 1988-1989. Cooperating institutions will be the Institute for Intercultural Studies, New York, the Institute for the Study of Diplomacy, Georgetown University, the Institute for Psychiatry and Foreign Affairs, and the International Monetary Fund.

As a unit of the public service arm of the Smithsonian, the Office serves both a broad general public and at the same time brings benefits to high schools, colleges, and universities seeking resources for the improvement of their curricula. Similarly, the symposia benefit practitioners of law, medicine, journalism, public

administration, and other professions. New efforts are under way to attract participation of business and labor leaders as well as minorities.

III. Office of Elementary and Secondary Education (OESE) - With base funding of 7 workyears and \$354,000, the OESE offers a number of programs to encourage cooperation and exchange of information between the Smithsonian and schools in the Washington, D.C., area. LET'S GO (a newsletter published five times each school year) informs teachers about the variety of educational opportunities available at the Smithsonian to teachers and students at all grade levels. This newsletter is sent to approximately 11,000 teachers in the Washington, D.C., area. During FY 1987, more than 300 participants attended a workshop and seminar program for teachers. Resulting from these summer courses, curriculum units based on the Smithsonian's collections were developed. Summer programs for teachers included a series of in-depth, one-week, fully-accredited seminars on such topics as, teaching life sciences through direct observation, using community resources to teach about the United States Constitution, and teaching American cultural history through art.

To share these same teaching concepts with a national audience, the Office distributes ART TO ZOO, a classroom journal, to approximately 65,000 teachers and museum education departments throughout the United States and circulates free of charge two slide loan packages, titled "The Museum Idea" and "Museums as Story-tellers," which reach an estimated 3,000 students during the school year. In the spring of 1987, the Office sponsored a two-day symposium on "Teaching the Constitution," in which noted scholars and educators presented lectures and workshops to an audience of more than 150 teachers. The Office offered for the seventh straight year, in cooperation with the University of Virginia, a summer graduate course on using museums to teach writing. Beginning in September 1987, a precis of the symposium's sessions was available free of charge to educators nationally.

During FY 1987, the Office continued its work to make Smithsonian programs accessible to disabled visitors by providing interpreters at special events, lectures, and tours, as well as by offering guidance to the various Smithsonian museums who are seeking ways to offer more effective programming for retarded, hearing-impaired, and blind visitors. Sign language classes were given to teach approximately 75 Smithsonian educators, guards and other employees how to communicate with hearing-impaired visitors. Also, the Office published a manual and videotape package, designed to help museums, zoos, and historic sites across the country to more effectively serve disabled people.

IV. National Science Resources Center - With base funding of 3 workyears and \$184,000, the National Science Resources Center (NSRC) has been established by the Smithsonian Institution and the National Academy of Sciences to improve the quality of precollege science and mathematics education. Convinced that any effort to improve the quality of science education must involve both educators and scientists, the NSRC is working closely with state and local school systems, research scientists, educational and scientific organizations, and science museums to develop high-quality materials and programs that will meet the needs of classroom teachers throughout the Nation.

A major part of the NSRC mandate is to identify, develop, and disseminate science and mathematics teaching materials that are imaginative, classroom-tested, and scientifically up-to-date. The Center also organizes leadership-development institutes for school system personnel, to encourage the sharing of successful

materials and programs, and to help build a talent pool to staff local program improvement efforts.

The NSRC has begun a project called Science and Technology for Children (STC) to improve the teaching of science in the Nation's elementary schools. During FY 1987, a four-week STC workshop brought together 70 scientists, elementary school teachers, science supervisors, and science museum educators to develop "hands-on" resource units for use by elementary teachers in grades one through six. The STC science units, which address important topics in life science, physical science, earth science, and technology, actively involve elementary school children in "hands-on" science investigations. These investigations develop children's problem-solving and critical thinking skills, while broadening their understanding of basic science concepts. The units will be field tested and disseminated in cooperation with a network of school systems, state departments of education, science museums, and university science teaching centers that are working together with the NSRC to improve the teaching of science in the Nation's elementary schools.

The participants in the STC summer workshop included 50 elementary school teachers and science supervisors, representing 16 school systems across the Nation. These teachers and supervisors came from inner city school systems, rural schools, Native American schools, Department of Defense Dependents Schools, and suburban school districts. Twenty scientists from universities, science museums, and research laboratories also participated in the workshop.

In July 1987, the Secretary of the Smithsonian Institution and the President of the National Academy of Sciences established an Advisory Board for the National Science Resources Center. The membership includes representatives from several major United States corporations, eminent scientists, and educational leaders from throughout the country. The NSRC Advisory Board will advise and assist the NSRC's executive director concerning broad policy issues and will help set priorities for the Center's programmatic activities.

EXPLANATION OF PROGRAM INCREASES - For FY 1989, an increase of 1 workyear and \$88,000 is requested to provide expanded support for ongoing seminar series (\$15,000); to support the development of educational materials for preschool teachers and students in commemoration of the Columbus Quincentenary (\$38,000); to establish and maintain the NSRC teaching resource collection and data base (1 workyear and \$35,000).

I. Office of Interdisciplinary Studies - Expanded Support for Ongoing Seminar Series (\$15,000). For FY 1989, an increase of \$15,000 for the Office of Interdisciplinary Studies is requested to provide support necessary to carry out primary responsibilities for interdisciplinary activities: specifically, the development of a new seminar series, "Ways of Knowing," to which the Institution attaches great importance; the revival of the "Voluntarism and the Public Interest in American Society" series, which serves a broad constituency; and planning for the Columbus Quincentenary symposium (tenth in the international symposium series, "Exploring the Unknown").

The requested increase for travel (\$3,000) would permit two professional staff members to conduct wider-ranging field research and liaison with individual scholars and research institutions than the director alone can accomplish. Also this increase would provide travel funds for visiting seminar speakers and program advisors. In addition to face-to-face consultations, communications with resource persons in the United States and abroad by telephone play a vital role in the development of programs

(\$1,000). The increase in other services (\$10,000) will support the cost of honoraria for speakers and essayists; professional contractual services; and various event support services, such as security, audio- and videotaping.

The Office also needs basic supplies and materials (\$1,000) including reference books and subscriptions to scholarly publications. Without these funds, the Office's ability to carry out its mission effectively will be greatly restricted. It is anticipated that funds will be sought in FY 1990 for an additional program assistant. Additional funds will be sought in the future for printing, training, travel, other services, and equipment.

II. Office of Elementary and Secondary Education - Quincentenary Materials (\$38,000). An increase of \$38,000 is requested to support the development of educational materials for preschool teachers and students in commemoration of the Columbus Quincentenary. This increase will be required for FY 1989 and FY 1990.

As an overarching theme, the Smithsonian's Institution-wide Quincentenary program, "The Americas: Past, Present, and Future," will explore the intellectual, cultural, and ecological diversity of the Americas. As stated by Secretary Adams in his opening remarks for the 1985 Quincentenary Planning Conference, the Institution has a "responsibility to rectify [the] selectiveness and lack of historical depth in our popular perceptions of Latin America. The task before the Smithsonian is not to focus upon the 'discovery' of America by Columbus as a single event. Our focus needs to be on [the] larger and historically more important--not event--but process--five centuries of growth--that proceeded from that event in 1492."

With these broad Institutional objectives in mind, the OESE is now developing a number of programs for teachers and students, including initiatives in publishing and teacher education, which will be based on and funded through such already existing activities as ART TO ZOO and summer seminars for teachers. In addition, but not as part of any existing program, the Office hopes to work with the Spanish Education Development Center in Washington, D.C., to develop, test, and publish a series of activity kits for preschool teachers and students. For this effort, the requested funding is needed for FY 1989 and FY 1990.

The kits will be based on lessons that will be developed and tested during FY 1989 by an outside contractor working under the direction of the OESE. In FY 1990, the materials will be revised and published for distribution beginning in 1991. All materials will be tested at various stages of their development in a number of different schools, enabling the Office to fine tune them before publication. Through this process of testing and revision, the Office will be able to ensure the appropriateness of the kits' content, format, and educational level.

The kits will draw on the resources of a number of different Smithsonian museums and the National Zoo. In developing the units, the OESE will consult frequently with appropriate museum education departments and curatorial divisions, especially within the National Museum of Natural History.

Providing the teachers with all the materials necessary to teach a series of lessons, the finished kits will consist of detailed lesson plans, as well as materials for the students to use. All of the lessons will incorporate an experiential approach to learning, proven to be extremely successful with young children. Especially important among the student materials will be the inclusion of three-dimensional

objects, including reproductions of artifacts and specimens from Smithsonian collections.

The kits will be loaned to preschools and community center programs for young children throughout the United States and Latin America. Through a system now in place for disseminating educational materials nationally, the OESE will serve as the distribution center for the United States. Distribution in Latin America will be managed by the Organization of American States (OAS). Using its network of contacts with Latin American and Caribbean Ministries of Education, the Education Department of the OAS will assume responsibility for distributing at least one copy of the entire series to each country. The Ministries will then become the loan centers for their respective countries, aided by the OAS in advertising and maintaining the kits. This method will allow maximum use of the materials while keeping maintenance and mailing costs to a minimum.

The requested increase will allow the Office to hire a full-time contractor (\$27,000) and consultants (\$1,000) as well as initial production costs of kit materials (\$10,000).

III. National Science Resources Center - Establish and Maintain NSRC Teaching Resource Collection and Information Data Base (1 workyear and \$35,000) - For FY 1989, an increase is requested to enable the NSRC to establish and maintain a teaching resource collection and information data base of science and mathematics teaching resources.

An increase is sought to hire a data base specialist/resource center librarian to establish and maintain the teaching resource collection in the NSRC science and mathematics curriculum resource center (1 workyear and \$35,000). This person also will design and maintain an on-line computer information data base of science and mathematics teaching resources. The data base specialist/resource center librarian will respond to requests for information and assistance from teachers and curriculum specialists in state and local school systems throughout the Nation.

Widening the Smithsonian's educational outreach through the development and dissemination of new teaching materials is one of the Secretary's areas of emphasis. The establishment of the NSRC curriculum resource center will help the NSRC respond to this priority by providing facilities and resources that can be used by people participating in NSRC materials development workshops and leadership development institutes. The NSRC's computerized information data base of these science and mathematics resource materials will be used by people participating in NSRC resource development projects and will be made available to science educators and teachers throughout the Nation, by means of a computerized telecommunications network.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - I. Office of Fellowships and Grants - These are provided from allotments which are designated primarily for an Institution-wide program of graduate student, predoctoral, postdoctoral, and senior postdoctoral fellowships, as well as opportunities for shorter visits from scholars and students.

The Regents Fellowship program continues to bring distinguished visiting scholars to the Institution. Funding also is provided to support stipends for minority internships and faculty fellowships, for minority students pursuing graduate

degrees under the Education Fellowship Program, and stipend support for the Native American Awards Program. A program allotment supports a small portion of the administration of the Office of Fellowships and Grants academic programs.

II. Office of Interdisciplinary Studies - An allotment is provided for salaries and support of OIS programs. In FY 1987, funds were primarily directed toward the "Constitutional Roots, Rights, and Responsibilities" symposium.

III. Office of Elementary and Secondary Education - As part of the Institution's affirmative action effort, a Career Awareness Program (CAP) for the District of Columbia Public Schools introduces minority young people to career opportunities at the Smithsonian. The OESE plans and runs the CAP with help from the various Smithsonian museums, whose staff members work directly with the students, providing first an overview and then a more in-depth experience of a wide range of Smithsonian careers. During the 1986-1987 school year, ten students from a District of Columbia high school participated in CAP programming at the Hirshhorn Museum and Sculpture Garden. Through the District's Summer Youth Employment Program, arrangements were made for 63 CAP graduates from this and past years to work at the Smithsonian during the summer of 1987. The CAP-LET, a quarterly newsletter, helps maintain the graduates' involvement in the program. In addition, after extensive evaluation of the CAP, plans are under way to extend the program nationally through development of a manual and curriculum package for use by teachers and museum educators. These materials, slated for publication in FY 1988, are designed to enable local museums to institute programs that will interest minority young people in museums and museum careers.

In FY 1987, the Office continued to sponsor regional workshops in communities across the United States for the purpose of promoting the use of museums as educational resources. Among the regions to hold major one-day events in FY 1987 were Shreveport, Louisiana; Philadelphia, Pennsylvania; Waterloo, Iowa; and Jackson, Michigan. Communities which have begun working with the OESE to plan events for FY 1988 include Wilmington, North Carolina; Tucson, Arizona; and St. Louis, Missouri. Approximately 500 teachers are reached by each of these workshops.

Now in its second year, the Internship Program for High School Teachers, brought five teachers, from communities where Regional Workshops had been held to the Smithsonian for an in-depth experience. Designed to have a multiplier effect by training master teachers to serve as catalysts for the creation of more effective museum/school programming in their home communities, this program carries three graduate credits from the University of Virginia.

A High School Summer Intern Program, now in its 13th year, gives 40 graduating seniors an opportunity to participate in a learning/service program at the Smithsonian, working behind the scenes with curators and other museum professionals. Young people from all 50 states and the District of Columbia are eligible to apply for admittance to either of two five-week sessions. Successful candidates received free lodging and transportation to and from Washington as well as a \$500 stipend.

IV. National Science Resources Center - An allotment from unrestricted funds provides partial funding for the core operations of the National Science Resources Center. These resources provide support for the NSRC executive director, program director, and also provide the core support necessary for the development of program initiatives to attract further support from the private sector in alliance with the National Academy of Sciences.

Restricted Funds - I. Office of Fellowships and Grants - These consist of restricted endowments, gifts and grants from individuals and foundations which specify their use for a particular project. For example, an endowment from the Walter Rathbone Bacon Scholarship supports awards for research on fauna from outside the United States, the James E. Webb Fellowship Program is designed to promote excellence in the management of cultural and scientific organizations, and a Rockefeller Foundation Grant supports fellowships in residence at the National Museum of African Art and the Center for Asian Art.

II. Office of Interdisciplinary Studies - Funds were raised to partially support the Office's participation in the "Constitutional Roots, Rights, and Responsibilities" symposium and the development of teaching materials based on this symposium. In October 1987, the first General Foods World Food Prize was awarded at the Smithsonian in recognition of a selected individual's outstanding contributions to expanding and improving the quality, quantity, or availability of food throughout the world. The Office presented a colloquium on "Science, Ethics, and Food" the day of the award ceremony to heighten awareness of and interest in vital issues pertaining to the global food chain.

III. Office of Elementary and Secondary Education - Another OESE program for the District of Columbia Public Schools is "Exploring the Smithsonian," which served close to 5,000 young people in FY 1987. Supported in part by a grant from the Cafritz Foundation, this program provided bus transportation to bring junior high school students to the Smithsonian museums to take part in a selection of interdisciplinary lessons on curriculum-related subjects in art, history, and science. The OESE worked with the various Smithsonian education offices to plan and maintain the program activities. This program will be suspended for FY 1988, while a committee (composed of museum and public school educators) redesigns the offerings to conform to the new junior high school curriculum.

MUSEUM SUPPORT CENTER

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	40	4,475	-	-	-	127	-	-	-	-
FY 1988 -Estimate	36	4,475	-	-	-	59	-	-	-	-
-Base	36	4,491								
FY 1989 Estimate	42	4,659	-	-	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	36	6	42
11 Personnel Compensation.....	886	113	999
12 Personnel Benefits.....	133	19	152
21 Travel.....	14	-	14
23 Rent, Communications & Utilities.....	10	-	10
24 Printing & Reproduction.....	3	-	3
25 Other Services.....	143	20	163
26 Supplies & Materials.....	146	10	156
31 Equipment.....	3,156	6	3,162
Total	<u>4,491</u>	<u>168</u>	<u>4,659</u>

Analysis of Increase

Necessary Pay.....	18
Program Funds.....	150

ABSTRACT - The Museum Support Center (MSC), located in Suitland, Maryland, adjacent to the Institution's Suitland Facility, provides a state-of-the-art facility for the care, conservation, and storage of the Institution's collections. The conservation facilities at the MSC include the Conservation Analytical Laboratory and conservation labs for the National Museum of Natural History/Museum of Man and the National Museum of American History. The collection storage area at the MSC occupies four discrete sections (or pods) and provides three types of storage space:

"high-density" storage for collections stored in cabinets; "wet" storage for collections stored in alcohol; and "high-bay" storage for very large objects.

For FY 1989, an amount of 42 workyears and \$4.659 million will permit the Institution to purchase collection storage cabinets and components (\$3.058 million); continue the preparation and transfer of collections to the MSC (\$459,000); provide ongoing administration and building management services at the MSC (36 workyears and \$992,000); and develop a program to evaluate the effectiveness of asbestos decontamination techniques as applied to museum objects prior to their move to the MSC (6 workyears and \$150,000). Necessary pay of \$18,000 is required for existing staff.

PROGRAM - The Museum Support Center, located in Suitland, Maryland, provides a state-of-the-art facility for the storage of museum collections; the conservation and preservation of museum objects; and conservation training. The Conservation Analytical Laboratory, the Anthropology Conservation Laboratory of the Museum of Natural History, and some of the facilities of the Division of Conservation of the Museum of American History all are located at the MSC. Conservation facilities occupy a significant portion of the laboratory wing, and their activities include conservation treatment, scientific analysis, and training. The Museum Support Center branch of the Smithsonian Institution Libraries system, one of five conservation libraries in the world and the only one in this country that provides a reference service on conservation, maintains a collection of more than 1,500 books and 60 periodical titles.

Collections storage facilities at the Museum Support Center are arranged in four discrete sections of the building, known as "pods." Approximately five-eighths of the total storage space (Pods 1 and 2, and a portion of Pod 4) will be occupied by collections stored in cabinets on three levels of concrete decks. In addition, one of the pods (Pod 3) has been reserved for the storage of "wet" collections (those stored in alcohol), and a portion of Pod 4 will be used for "high-bay" storage of very large objects.

The move of Smithsonian collections to the Museum Support Center is unprecedented in the museum community in terms of volume, characteristics and variety of the collections, and the distance involved. The preparation and move of collections to the MSC from the National Museum of Natural History/Museum of Man and the National Museum of American History began in FY 1983 and is scheduled to continue through FY 1993. The National Museum of Natural History/Museum of Man alone is sending millions of objects and specimens to the MSC. The entire transfer of the collections is occurring over a multi-year period, with portions being moved only when appropriate storage equipment at the MSC has been installed.

Current Status of the Museum Support Center - The Museum Support Center has proven to offer an effective solution to the Institution's storage needs, yet has continued to be beset with problems. On the positive side, the great majority of the space in the laboratory wing has been put to use; many objects and specimens have been relocated; and more collections continue to be prepared for moving. On the negative side, the General Contractor for the construction of decks in the pods and the procurement of storage cabinetry has recently been terminated by the General Services Administration for unsatisfactory job progress. The lack of collection storage equipment has meant that certain collection-related laboratory and office functions have not yet been able to relocate and that the move of collections has been limited and delayed greatly.

Meanwhile, occupancy of the laboratory wing and the establishment of the MSC administrative structure has taken place, and the services provided by these offices and laboratories are functioning well. The Conservation Analytical Laboratory (CAL), the Anthropology Conservation Laboratory, and a branch of the Museum of American History Conservation Laboratory, which occupy about half of the laboratory wing, continue their work. In addition, new programs and functions are becoming a reality at the MSC, such as the Molecular Systematics Laboratory. The MSC Administration efficiently provides users of the facility with a wide range of services. The Computer Center used for research and inventory control purposes and the multiple services provided by the facilities management unit are examples.

While relocation of collections to the MSC is largely a function of the availability of appropriate collection storage equipment, the problem cited above in the procurement of this storage equipment system has not proven to be insurmountable. The move into the "wet" collection storage equipment in Pod 3 was completed in 1985 with over 260,000 specimen lots transported to the MSC in 200 van loads. Since that time, more than 45,500 additional specimen lots, which are a part of ongoing departmental activities, have been moved into Pod 3. Other collections have been received at MSC and placed in temporary locations until such time as permanent facilities become available. The following collections have been moved from the Mall to the MSC: over 195,500 archeological objects (representing 25 percent of those collections) and 17,500 ethnological objects from the Department of Anthropology; more than 3,814,000 insect specimens from the Department of Entomology; over 36,500 petrology and meteorite specimens from the Department of Mineral Sciences; 667,000 specimens from the Department of Paleobiology; and 132,000 specimens from the Department of Botany, including diatoms and algae. All of these collections have been cleaned carefully, inspected for pests and conservation problems, and properly stabilized. These relocated collections are stored under less crowded and better environmental conditions, and, as a result, have far greater potential for long-term preservation and use than collections stored in most other Smithsonian storage areas. As more collections are prepared, they will continue to be moved to temporary storage in the MSC and the Mall buildings until their permanent storage locations are ready.

While such progress is positive and encouraging, only a small fraction of the MSC's potential as a collection support facility can be realized without the availability of the storage system for Pods 1, 2 and 4. Meanwhile, collection management problems, which the MSC was created to rectify, continue for collections scheduled to move.

Museum Support Center Storage Equipment - Design work for a collection storage system for the MSC began in September 1980. In consultation with the General Services Administration (GSA), the Smithsonian's agent for procuring the Museum Support Center's Collection Storage Equipment System, and with the architectural/engineering team's material handling consultant, and on their recommendation, the Institution decided to use a storage system that utilized a number of standard components. The system was to be a self-supporting three-level storage structure capable of holding the various kinds of shelves, drawers and screens needed to keep the collections safe from dust and insects while making them accessible for research, study and exhibition. This design was a pioneer effort, since no other such system existed for museum purposes.

After intensive efforts by the Institution, GSA, the architectural/engineering firm and the Contractor, the Institution was advised late in 1984 that the require-

ments for enclosure (bug-free, airtight) for the collection storage equipment for Pods 1, 2 and 4 could not be met by the self-supporting system. Therefore, it was decided to switch to a more conventional collection storage system, consisting of pre-manufactured storage cabinets on three levels of concrete decks. This work began in the summer of 1985. Some modification of the existing pod floor slabs became necessary to properly distribute weight loads of the new system.

Since that time, this contract has continued to be beset with problems. The performance of the Contractor has been untimely and deficient. As a result, on July 15, 1987, the General Services Administration determined that the General Contractor's performance was unsatisfactory and issued a termination for default. GSA is proceeding now to reprocurer this storage equipment and recover the excess reprocurement costs by appropriate means. GSA is currently expecting to issue the contract reprocurement documents in two bid packages. One will be to acquire the general construction components, including the structural system, general architectural work, and utilities systems. The other will be to acquire storage cabinets, compactor frames and cantilever shelving. This package may be further split to reduce the delivery time and/or to obtain the best pricing. A collection storage equipment consultant has been engaged to conduct a market survey of the storage industry, to advise on the best type of procurement, and to assist in the development of drawings and specifications. (GSA's tentative estimate for awarding the general construction package is October 1988 and for awarding the collections storage package is, at the earliest, February 1989. The type of procurement recommended as a result of the market survey may change the schedule.)

Since the recovery of excess reprocurement costs may take several years and the Institution must transfer the total project cost to GSA prior to the contract award date, the funding provided in FY 1988 (\$3,058,000) has been devoted to the reprocurement of the "high-density" storage equipment. As a result, the procurement of the "high-bay" storage equipment (\$1,750,000) will be postponed until FY 1989. This funding level is based on the estimated cost of this equipment in FY 1985 (\$1.54 million) and an allowance to compensate for the accumulated effects of inflation since that estimate was calculated. (Actual cost for the "high-bay" storage equipment may vary as the result of actual bids received at the time of procurement and the inflation rate in effect at the time of the bid for the city of the bidder.) Also, funding is contained in this budget (\$1,308,000) to complete the purchase of shelves and drawers for the "high-density" storage equipment needed for the initial move.

Between FY 1981 and FY 1988, funds totaling approximately \$25 million have been obligated to purchase and install the "wet" storage and the "high-density" storage equipment for Pods 1, 2 and 4. The FY 1989 request will continue the FY 1988 level of funding (\$3.058 million). It is currently estimated that additional funding totaling approximately \$18.7 million will be needed from FY 1990 through FY 1993 to make full utilization of all available storage space in the MSC. (Actual costs for the collection storage equipment to be procured from FY 1990 through FY 1993 may vary as the result of actual bids received at the time of procurement and the inflation rate in effect at the time of the bid for the city of the bidder.)

Funding for MSC Collection Storage Equipment
FY 1981 - FY 1989

	<u>(\$000's)</u>
FY 1981 Actual	2,051
FY 1982 Actual	3,325
FY 1983 Actual	3,469
FY 1984 Actual	3,090
FY 1985 Actual	3,505
FY 1986 Actual	3,363
FY 1987 Actual	3,165
FY 1988 Approp.	3,058
FY 1989 Request	<u>3,058</u>
 <u>Total</u>	 <u>28,084</u>

Move of the Collections to the Museum Support Center - Beginning in FY 1983, a detailed plan for the coordination of each phase of the move was developed using the principles and techniques of the "Critical Path Method" (CPM). Information affecting the complex schedules has been automated and is updated continuously. Simultaneously, decisions also were made regarding the specific methods of packaging and modes of transport appropriate to the particular collections and objects involved. Since FY 1983, temporary museum technicians have been preparing the collections to be moved, including cleaning and stabilizing objects; packing and moving them within the museums to staging areas and then to the MSC; and performing conservation treatment when needed.

Preparation of "dry" collections (to be stored in Pods 1, 2 and 4) continues with work being done on the collections of the Museum of American History and the following Departments of the Museum of Natural History: Anthropology, Entomology, Mineral Sciences, Vertebrate Zoology, Botany and Paleobiology. The move of these and other collections to their final storage locations was planned to begin in FY 1988 following the installation of storage equipment. Most of these moves were scheduled for calendar years 1989 through 1991, with the relocation of some collections continuing through calendar year 1992. The present procurement plan for the acquisition of the storage equipment has disrupted these move schedules and made the forecasting of new schedules impossible until such time as a new contract schedule becomes clear.

After the installation of the "high-bay" storage equipment, scheduled for FY 1989, the schedule currently projects that the move of "high-bay" collections (oversized objects such as whale skulls, rickshaws, weaving looms and totem poles) will begin in FY 1990 and continue for the next two years.

Between FY 1983 and FY 1988, funds totaling approximately \$2.8 million have been spent to prepare the collections for relocation, to move collections for which there is storage equipment, and to cover the salary costs of the temporary work force engaged in cleaning, packing and moving collections. The FY 1989 request will continue the FY 1988 level of funding. It is anticipated that future funding requirements for the move will total approximately \$2.5 million from FY 1990 through FY 1993.

Funding for the MSC Move
FY 1983 - FY 1989

(\$000's)

FY 1983 Actual	562
FY 1984 Actual	483
FY 1985 Actual	427
FY 1986 Actual	468
FY 1987 Actual	413
FY 1988 Approp.	448
FY 1989 Request	<u>459</u>

<u>Total</u>	<u>3,260</u>
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Administration and Facility Management - With base funding of 36 workyears and \$980,000, the Office of the Director of the Museum Support Center is responsible for administrative coordination of the activities of the various user and support units; of the automated data processing center used for registration and collections management activities, including the move to the MSC; and of the research and informational requirements of the occupants. The Office also oversees the procedures established to control and account for the flow of collections into and out of the MSC and insures the safety of the collections against pest infections and other hazards. Under the general supervision of the MSC's Office of the Director, the facility manager is responsible for providing shipping and receiving services, moving equipment and objects, overseeing safety and security operations, and cleaning and maintaining all parts of the building. Because of the need to maintain very strict environmental standards for the care and storage of museum objects, cleanliness is a fundamental requirement in the successful operation of a collection management facility.

EXPLANATION OF PROGRAM INCREASE:

Evaluation of Asbestos Decontamination Techniques (6 workyears and \$150,000)- For FY 1989, an increase of 6 workyears and \$150,000 is requested to develop a program for evaluating the effectiveness of various cleaning techniques employed in the decontamination of museum objects to be moved to collections storage areas at the Museum Support Center. The decontamination is necessary because the collections storage spaces in which these objects have been stored (exposed to their environment)--in the Museum of Natural History, the Museum of American History, and the Institution's Suitland Facility--have been found to be contaminated by asbestos. The evaluation of the efficacy of the cleaning techniques employed in this decontamination process is necessary so that the Institution can be certain that these collections have been effectively cleaned and pose no human health threat in their continued use as objects for scientific research and public exhibition. For many years, the uncertainty surrounding these contaminated collections has effectively denied their full scientific utility. Moreover, this uncertainty currently stands as a roadblock to the relocation of these objects to the Museum Support Center. This program also has an important Institution-wide application beyond the move to the MSC. Using this program, Smithsonian museums will be able to validate cleaning techniques which have been, and will be, employed in the decontamination of museum objects, so these objects may be returned to full an unrestricted use.

An approach to develop the program to evaluate asbestos cleaning techniques has been proposed by the Institution's Office of Environmental Management and Safety. The program would utilize strict surface testing and air monitoring methods to determine the level of asbestos contamination of museum objects, both before and after cleaning. It is hoped that, with the collaboration of the National Asbestos Council (NAC), the design and implementation of this program may be assisted by the technical guidance of a review group of the NAC's Subcommittee on Surface Asbestos Contamination Sampling, Analysis, and Evaluation Methodologies. In any event, the program must be defined, implemented, and tested at the earliest possible date so that the affected museum objects can be cleaned and freed for use and relocation. Presently, neither the Office of Environmental Management and Safety nor the National Museums of Natural History and American History have the staff resources or funding required for the development and testing of this program.

The requested increase will make possible the hiring of staff to carry out this badly needed project. Two temporary positions for a project supervisor and technical assistant (2 workyears and \$47,000) will provide the core staff required to implement, manage, and test this program. A team of four temporary museum technician positions (4 workyears and \$67,000) will assist the core staff with the execution of the work. In addition, a sum of \$36,000 is requested for the purchase of specialized equipment and supplies and the procurement of necessary laboratory analysis services.

It is currently projected that this level of funding will also be needed in FY 1990 and FY 1991 to continue the evaluation of a variety of cleaning techniques as they are applied to the wide range of museum object types, as defined by surface texture, form, fragility, and other physical characteristics.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - An allotment of \$750,000 was provided to purchase special laboratory equipment for the Conservation Analytical Laboratory. It is anticipated that the entire sum will have been expended by the end of FY 1988.

ADMINISTRATION

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	256	14,247	198	8,650	20	2,412	-	124	-	-
FY 1988 -Estimate	294	21,751	203	12,898	20	2,353	-	185	-	-
-Base	294	21,933								
FY 1989 Estimate	332	24,312	203	12,749	16	2,153	-	107	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	294	38	332
11 Personnel Compensation.....	9,618	1,010	10,628
12 Personnel Benefits.....	8,382	405	8,787
13 Benefits to Former Employees.....	398	-	398
21 Travel.....	97	20	117
22 Transportation of Things.....	8	-	8
23 Rent, Communications & Utilities.....	172	50	222
24 Printing & Reproduction.....	56	-	56
25 Other Services.....	1,770	837	2,607
26 Supplies & Materials.....	639	34	673
31 Equipment.....	793	23	816
Total	<u>21,933</u>	<u>2,379</u>	<u>24,312</u>

Analysis of Increase

Necessary Pay.....	292
Program Funds.....	2,108
Workers' Compensation.....	43
Grade Target Reduction.....	-186
Payroll Personnel System.....	122

ABSTRACT - Administration includes central management, planning, oversight and review provided by the Offices of the Secretary, Under Secretary, Assistant Secretary for Administration, General Counsel and Treasurer. It also covers a wide range of

specialized administrative and technical offices. Included among these are Audits and Investigations, Business Management, Congressional Liaison, Contracts, Equal Opportunity, Facilities Services (responsible for Design and Construction, Plant Services, Protection Services, Environmental Management and Safety Programs and Architectural History and Historic Preservation), Financial Management and Planning, Accounting and Financial Services and Risk Management. Other offices comprising this grouping include Information Resource Management, Management Analysis, Personnel Administration, Printing and Photographic Services, Procurement and Property Management, Programming and Budget, Special Events and Travel Services. These organization units receive both appropriated funds and nonappropriated unrestricted Trust funds for their operating support in approximate balance to the overall funding of the Institution. Some offices, however, such as Business Management, Contracts and Risk Management are funded entirely with trust funds reflecting their responsibilities. The funding for the Workers' Compensation account is also included here.

For FY 1989, an increase of 22 workyears and \$1,469,000 is requested for the following purposes. The Office of Audits and Investigations requires \$30,000 on a one-time basis to implement an automated management system. The Office of Facilities Services requests an increase of 1 workyear and \$66,000 to provide coordination of the development and implementation of automated programs for more efficient management of Facilities Services programs and interaction with client and other support organizations. The Office of Architectural History and Historic Preservation requests 1 workyear and \$29,000 to provide staffing for the research and documentation function of the Office. The Office of Financial Management and Planning requires 1 workyear and \$100,000 to fund an existing base deficiency and a further amount of \$400,000 to continue and complete the Institution's implementation of integrated financial management systems. The Office of Accounting and Financial Services requests 5 workyears and \$94,000 for staffing requirements in accounts payable, account reconciliations, account procedures and data entry. The Office of Information Resource Management requests 2 workyears and \$68,000 to support mainframe systems-software functions and an increase of \$100,000 is required to fully implement the Personnel Payroll System. The Office of Personnel Administration requests 4 workyears and \$126,000 to meet legal requirements, to improve current personnel services and to maintain pace with the projected growth of employment. The Office of Procurement and Property Management requests 2 workyears and \$126,000 to complete its management organization and to strengthen its capabilities to manage automation requirements. Increases of 6 workyears and \$400,000 are sought for the Office of Environmental Management and Safety to continue a phased program to bring Smithsonian operations into compliance with laws and regulations aimed at protecting facilities, staff, visitors and the environment from safety and environmental hazards. These increases are offset by a decrease of \$70,000 associated with nonrecurring expenditures in FY 1988 for storage systems for the Hazardous Waste Program and for computer equipment.

Also included in this line item are increases of \$43,000 for Workers' Compensation; \$122,000 for operating costs of the new Personnel Payroll System; and a reduction of \$186,000 reflecting anticipated savings from the Office of Management and Budget's requirement to reduce the number of employees in grades 11 through 15. These items are discussed in the Uncontrollable Increases section of this budget. Necessary pay of \$194,000 is required for existing staff, along with 3 workyears and \$98,000 required to annualize the partial-year funding of 12 new positions approved in the FY 1988 budget.

Funds totaling \$639,000 and 13 workyears for management and technical costs associated with the enhancement of the Smithsonian's repairs and restoration programs are being requested for the Offices of Environmental and Safety (2 workyears and \$106,000), Procurement and Property Management (8 workyears and \$425,000), Personnel Administration (1 workyear and \$42,000), Accounting and Financial Services (1 workyear and \$20,000), and Audits and Investigations (1 workyear and \$46,000). The justification for these funds and other administrative costs is contained in the Repairs and Restoration section of this budget request.

PROGRAM - Within this activity grouping, the Office of the Secretary, with the assistance of the Office of the Under Secretary, is responsible for management and administration including policy determination, program planning, legislation and the direction and review of performance of activities. The Office of the Assistant Secretary for Administration, including the Director of Facilities Services, is responsible for administrative and technical services and for facility planning, design, construction, operation and maintenance, protection, environmental and safety programs and for architectural history and historic preservation.

The Office of Audits and Investigations is responsible for performing all internal and external auditing and the investigation of any fraud, waste, abuse or white collar criminal activity. The internal audit function includes auditing Federal programs as well as Trust-funded activities on a recurring basis. The Office reports the results of audit findings and makes recommendations to aid management at all levels in program administration. 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. The investigation function involves examining acts of alleged criminal activities by employees or contractors, the results of which serve as the basis for appropriate criminal, civil or administrative remedies. Investigations also involve the review of programmatic and operational weaknesses susceptible to fraud and abuse. The work of the Office is considered by the Smithsonian's public accountants in determining the nature, timing and extent of the public accountants' audit procedures. Reports on audits and investigations and opportunities for direct contact with the Office are provided to the Audit and Review Committee of the Board of Regents.

The Office of the General Counsel provides counseling to the Smithsonian Board of Regents, the Secretary and other executive and program officers on legal matters involved in Smithsonian administration; coordinates and oversees the conduct of litigation and other adversary proceedings to which the Institution is a party; reviews administrative claims arising out of Smithsonian operations and generally monitors all aspects of Smithsonian activities for legal implications vis-a-vis new developments in the law.

The Office of the Treasurer has responsibility for financial management. This includes the direction of financial planning, accounting, payroll, financial reporting, administration of grants, insurance and risk management, handling of bank relations, oversight of investments and management of certain auxiliary activities. Components of the Office of the Treasurer include: Financial Management and Planning, Accounting and Financial Services, Risk Management and various business management offices, including Museum Shops, Mail Order, Product Licensing and Concessions.

The Office of Congressional Liaison is responsible for the development and maintenance of the Institution's relationships with the Congress; the presentation of policies, programs and plans to the Congress; the preparation and clearance of

legislative materials and the organization of Smithsonian participation at legislative hearings; and liaison with Federal agencies and organizations having related interests.

The Contracts Office handles sponsored research and other projects which are funded by state, federal, foreign and international governments. It prepares proposals for such projects and negotiates and administers any resulting grants or contracts. In addition, it handles certain specialized contracts (such as revenue-producing ones) related to Trust-funded operations.

The Office of Equal Opportunity plans, conducts and monitors a positive action program to provide equality in employment practices and program activities. Major efforts include an affirmative action program, program and facility access for disabled persons, employee counseling and complaint adjudication, upward mobility, programs for women, Hispanic and other ethnic groups and community outreach to minority and women's groups.

The Office of Information Resource Management oversees planning for new automated systems and technologies; helps determine information resource management policy; ensures the integrity and security of Institutional data; applies modern computer and communications technology in support of the Smithsonian's scientific, scholarly and management information activities; and ensures technical integration of hardware and software required to make information and computing power widely available to support users of information systems and computers. It acquires, develops and maintains high quality automated information processing and data communications systems; administers the Smithsonian's data processing cost center; operates computer systems and voice and data communications networks and provides a wide range of education and training services.

The Management Analysis Office provides staff assistance and advisory services in support of Smithsonian administrative operations. The Office performs studies of organizations, systems and procedures; prepares and distributes management issuances containing policy and instructions governing operations and conducts the Institution's forms management program and produces a bi-weekly Employee Bulletin.

The Office of Personnel Administration provides personnel services, advice and assistance to managers and employees of the Institution. Within the laws, rules and regulations of relevant controlling agencies and within the policies of the Institution, the Office is responsible for recruitment, staffing, position classification; wage and salary administration; performance management and merit pay systems; employee relations and benefits administration, planning, counseling, processing and communications. The Office also is responsible for labor-management relations; providing training and career development; employee assistance, job and retirement counseling; workers' compensation; unemployment insurance; personnel policy development; personnel management evaluation and records and data processing and maintenance and liaison with U.S. Department of Agriculture's National Finance Center regarding the administration of the Personnel Payroll System.

The Office of Printing and Photographic Services is the central office for technical advice, guidance and production of photography and duplicating services to curatorial, scientific, technical and administrative staff. Photographic services include studio and on-site photography, photographic copy restoration, printing, preservation of originals under archival conditions, the development and maintenance

of an automated catalogue of photographs, the investigation and application of new photographic technologies and sales of materials to the public.

The Office of Procurement and Property Management is responsible for the policy, planning and coordination of the procurement, contracting, property management and supply program for the Smithsonian Institution including its field operations. As the principal acquisition office for the Institution, it procures supplies, materials, contractual services and equipment for research, facility construction, renovation and repair, automated systems design and support including hardware and software and major auxiliary activity enterprises such as food services, as well as the Smithsonian's traditional curatorial and exhibits preparation activities. It also acts as the Institution's space leasing agent. As the central procurement management office for the Institution, it is responsible for the management, accountability, inventory and security of non-expendable property.

The Office of Programming and Budget formulates the consolidated Federal and nonappropriated Trust fund budgets for review and approval by the Secretary and the Board of Regents. Approved budgets are prepared for submission to the Office of Management and Budget (OMB) and to the Congress, and the Office serves as liaison with OMB and Congress on budgetary matters. Appropriated budgets and nonappropriated Trust fund budgets are monitored to help assure that program needs are met, budgetary goals are achieved and accountability is maintained. The Office prepares the Five-Year Prospectus, advises management on matters pertaining to program planning and development and incorporates financial information in central data bases for use in management reports, budgetary planning and special analyses.

The Office of Director of Facilities Services directs a wide range of programs essential to the security, operation, maintenance and repair of Smithsonian facilities and the expansion or alteration of the physical plant to support growth of programs and activities. The Office is responsible for long-range planning for facilities development and utilization, energy conservation and provision of facilities-related services. Reporting to the Director of Facilities Services, within the Administration grouping, are the Office of Environmental Management and Safety and the Office of Architectural History and Historic Preservation. The Office of Environmental Management and Safety is responsible for providing technical and professional services and support throughout the Institution for fire protection of its facilities and National Collections, occupational safety and health including industrial hygiene and hazardous materials control; as well as the review, dissemination and implementation of requirements of all new fire safety, health and environmental laws, regulations and standards. The Office of Architectural History and Historic Preservation is responsible for the architectural history of the Smithsonian, historic preservation issues and the Smithsonian furnishings collection.

The Office of Special Events plans and arranges events associated with exhibition openings, seminars, lectures and other activities upon the request of bureaus and offices and outside groups when given permission to use Smithsonian facilities. A monthly master calendar of special events is maintained.

The Travel Services Office makes travel arrangements in the most economical and effective manner consistent with Smithsonian and Federal travel regulations. Information concerning changes in travel procedures and regulations is distributed to bureaus and offices. Requirements for the use of contract carriers and United States carriers for international travel are enforced. The Office works closely with other offices in the development and implementation of new and revised travel regulations.

Progress in Administrative and Technical Support - Major emphasis over the past year and continuing for the current and future budget years includes the operation of the administrative and support activities to assure their responsiveness to needs. Particularly noteworthy activities, developments and accomplishments during FY 1987 included the following:

During FY 1987, the Office of Audits and Investigations issued nine internal audit reports covering such diverse operations as the Office of Personnel Administration; the Smithsonian bill payment process; timekeeping procedures and exhibit planning and production processes. Also, 25 contract audit reports were provided to the Contracting Officer, resulting in savings to the Institution of over \$400,000. Investigations staff opened a total of 27 cases, eight of which were the direct result of the Fraud Hotline. An additional nine hotline calls were received and referred for administrative action to other Smithsonian bureaus. A total of 29 investigations were closed during FY 1987 which resulted in the recovery of funds and adverse action being taken against 11 employees. Two of the cases were referred for prosecution and are pending at this date.

The volume and content of the workload of the Office of General Counsel continue to be directly affected by new initiatives in Smithsonian programming as well as by developments in the law having an impact on the administration of the Institution and its diverse programs. Such has been the case with, for example, the opening of the International Center, the National Museum of African Art, and the Sackler Gallery in the Quadrangle, the expected sale of the Museum of African Art property on Capitol Hill, the construction of the new restaurant facility at the National Air and Space Museum, Indian materials repatriation issues, discussions concerning the relocation of the Museum of the American Indian, the establishment of a Smithsonian Child Care Center, the enactment of the Immigration Reform Act, the Tax Reform Act of 1986, the Resource Conservation and Recovery Act, the Federal Employees' Retirement System Act of 1986, and the in-depth review of important policy issues such as drug testing, smoking restrictions, and sexual harassment.

The specific legislative accomplishments of the Office of Congressional Liaison include the reappointment of Smithsonian Regents and the authorization of funding to construct the Charles McC. Mathias Laboratory for Environmental Research at the Smithsonian Environmental Research Center (SERC) at Edgewater, Maryland. Measures providing for the repeal of the National Armed Forces Museum Advisory Board, and for the establishment of the National Museum of the American Indian will be the focus of continuing legislative activity.

The Office of Programming and Budget conducted an assessment of the Institution's internal budget formulation procedures. As a result, activities of the Office were enlarged to include responsibility for preparation of the Five-Year Prospectus. This change will strengthen Institution-wide planning and coordination with the budget process. Additionally, the Office proposed and the Institution adopted new budget and planning procedures which are described earlier in this document and are aimed at increasing the efficiency and effectiveness of management decisions. These procedures also resulted in increased use of automation in the assembly of the budget and the Prospectus.

The Office of the Treasurer has continued to emphasize improvement of financial management and accounting systems. Improvement to the Smithsonian's payroll personnel system was the number one priority for FY 1987 and FY 1988. The Smithsonian has

started using the Department of Agriculture's National Finance Center to run both its Federal and Trust payrolls. During FY 1987 a project was initiated to develop and implement a new financial system beginning with the general ledger function. This project is cognizant of and has as one of its goals consistency with the Office of Management and Budget's initiatives in this area. Included are emphases on the use of off-the-shelf software and standardization of the general ledger with government-wide efforts.

Under a research program in the Office of Printing and Photographic Services into applied photographic preservation, initial testing was completed and work published regarding a new toning solution whose use could eliminate a suspected carcinogen from laboratory use. In addition, the production of three video discs was completed with emphasis on railroad and other transportation subjects. Under investigation is the use of a newly developed still video system for potential important application to collections management and other projects. In the fall of 1987, the Office mounted its fourth annual exhibition, "History As Seen from the National Museum of American History." In addition, the Office's Smithsonian Institution Traveling Exhibition Service exhibition "The Vietnam Veterans Memorial: A National Experience" has been booked through mid-1989 and a second exhibition has been produced to meet demand. A related book on the Memorial, Reflections on the Wall, has entered a second printing.

During the Institution's sixth year of formal information resource management, the trends of modernization and distributed processing continued under the Office of Information Resource Management (OIRM). A major effort to survey and identify all Smithsonian data is paying off in improved design of new systems. The ongoing convergence of computer and communications technologies was responded to by the combination of the telephone management office of the Office of Plant Services with the OIRM's data communications office into a new OIRM division. The new division has begun strategic planning for integrated voice, data and image communications systems. Development of a new on-line collections information system continued under the general oversight of an Institution-wide committee. Choice of new accounting/budgeting/procurement software is expected during FY 1988. The transfer of personnel and payroll functions to the National Finance Center was completed at the beginning of FY 1988. Several general-purpose applications were developed on the new mainframe computer, including a system to provide bureaus with access to their accounting, personnel, and payroll data on-line. Tools for scientific and research data analysis and presentation are being installed on the mainframe also. Increasing emphasis was given to training of Smithsonian staff, to make more useful the growing number of microcomputers and the new mainframe applications; about 1,000 staff were trained in FY 1987.

The Office of Procurement and Property Management completed the purchasing and delivering of all furnishings and related equipment for the Quadrangle. The close-down of the Smithsonian Environmental Research Center in Rockville, Maryland, was completed successfully with the reutilization or sale of equipment and the sublease of the space. Major contracts negotiated included those for food service operations, the new restaurant at the Air and Space Museum, the Tupper Laboratory and Conference Center in Panama, the Personnel Payroll System with the National Finance Center and the acquisition of computer systems and equipment.

Particular activity in the Office of Personnel Administration included substantial revisions to the orientation program for new employees to provide a more welcoming, educational and efficient introduction to the Institution and to various specific benefits and other personnel matters. The Office performed effective work in

providing accurate data to the National Finance Center on Smithsonian civil service and trust employees for conversion to its personnel and payroll system. Implementation, including a substantial effort to inform and educate employees, of the Federal Employees Retirement System and its Thrift Savings Plan and the Immigration Reform and Control Act proceeded smoothly.

Viewed as one of the most important initiatives of FY 1988, the Office of Environmental Management and Safety (OEMS) is completely rewriting the Smithsonian handbook on Safety and Environmental Management to broaden its scope and application to meet today's needs. Additionally, a thorough review of OEMS' service delivery interface with other Smithsonian bureaus and offices resulted in the implementation of a number of procedural changes during the first quarter of FY 1988. For example, quarterly information-sharing sessions were established with safety coordinators appointed at the museum/facility-level. These sessions are designed to improve communications, increase awareness, and foster increased participation in day-to-day safety and health activities at all levels. Similarly, the establishment of a decentralized hazardous waste disposal program and quarterly meetings with assigned museum/facility-level hazardous waste coordinators has greatly improved the ability of the Smithsonian to identify, control, and properly dispose of hazardous waste in accordance with new laws and regulations, and reduce the potential for costly hazardous waste incidents within the Institution. The office will conduct a Safety and Environmental Management workshop during the third quarter of FY 1988. This effort is being coordinated with the Office of Museum Programs and will include the participation of representatives from the international museum community. Within the immediate Office of Environmental Management and Safety internal organizational efforts focused on enhancing staff productivity and professional growth.

Further information on management improvement activities is contained in the Introduction to this budget.

EXPLANATION OF PROGRAM INCREASES:

For FY 1989, an increase of 22 workyears and \$1,469,000 is requested for the following purposes. The Office of Audits and Investigations requires \$30,000 on a one-time basis to implement an automated management system. The Office of Facilities Services requests an increase of 1 workyear and \$66,000 to provide coordination of the development and implementation of automated programs for more efficient management of the Facilities Services programs and interaction with client and other support organizations. The Office of Architectural History and Historic Preservation requests 1 workyear and \$29,000 to provide staffing for the research and documentation function of the Office. The Office of Financial Management and Planning requires 1 workyear and \$100,000 to fund an existing base deficiency for Director of Financial Planning; and \$400,000 to continue and complete the Institution's implementation of integrated financial management systems. The Office of Accounting and Financial Services requests 5 workyears and \$94,000 for staffing requirements in accounts payable, account reconciliations, account procedures and data entry. The Office of Information Resource Management requests 2 workyears and \$68,000 to support mainframe systems-software functions and an increase of \$100,000 is required to fully implement the Personnel Payroll System. The Office of Personnel Administration requests 4 workyears and \$126,000 to meet legal requirements, to improve current personnel services and to maintain pace with the projected growth of employment. The Office of Procurement and Property Management requests 2 workyears and \$126,000 to complete its management organization and to strengthen its capabilities to manage automation requirements. The Office of Environmental Management and Safety requires 6 workyears and \$400,000 to

continue a phased program to bring Smithsonian operations into compliance with laws and regulations aimed at protecting facilities, staff, visitors and the environment from safety and hazards. These increases are offset by a decrease of \$70,000 associated with nonrecurring expenditures in FY 1988 for storage systems for the Hazardous Waste Program and for computer equipment.

Office of Audits and Investigations (\$30,000) - Funding in the amount of \$30,000 is sought on a one-time basis for the purchase of local area network computer equipment. This will enhance the Office's basic function of providing management with opinions on the efficiency, economy and effectiveness of Smithsonian programs and functions. It also will provide the tool to be able to detect fraud, waste and abuse more methodically. In addition, the network will streamline the current administrative procedures to allow more time for audits and investigations. In future years, as other Smithsonian bureaus network their computer to the main network, the Office of Audits and Investigations will be able to more easily access and analyze their data and perform more detailed analyses of larger amounts of data than is currently available.

Office of Facilities Services (1 workyear and \$66,000) - The requested increase of \$66,000 will provide support and coordination for development, implementation and management of automated programs for the Office of Director of Facilities Services and subordinate organizations for more efficient management of a wide range of facilities programs and for information sharing with client organizations and other Smithsonian support organizations. The oversight function of the Office involves extensive administrative requirements for review, tracking and reporting on project and financial status and coordination of activities between the five facilities services organizations: the Offices of Design and Construction, Protection Services, Plant Services, Environmental Management and Safety and Architectural History and Historic Preservation. Together these offices are responsible for the operation, maintenance, repair and preservation of the Smithsonian's physical plant, the security of property and the National Collections, and safety of staff and visitors. The ability to share information on a timely and continual basis is vital to the success of these facilities programs and the many major projects that require coordination between the individual organizations. Access to the networks within the facilities organizations will greatly improve the effectiveness and efficiency of management of the facilities programs and activities.

In addition, interaction between facilities services systems and those in other Smithsonian client and support organizations will enhance program and project management capabilities in areas such as financial and procurement, and will provide client organizations with ready access to project status information vital to coordination with ready access to project status information vital to coordination of facilities work with their ongoing programs and activities. A system administrator (1 workyear and \$50,000) is requested to oversee establishment and management of interactive systems to maintain the essential exchange of information on facilities activities. Support costs in the amount of \$16,000 for automation equipment, software development and supplies are also requested.

Office of Architectural History and Historic Preservation (1 workyear and \$29,000) - A new position is sought to provide staffing for the research and documentation function of this Office and for the active restoration work of the Office. The historic buildings of the Smithsonian are among its most valuable collections. The Office of Architectural History and Historic Preservation is responsible for advising on the most appropriate way to preserve these landmarks for

future generations. In order to do this, detailed information on the architectural history of each building, such as materials and colors used, structure, window systems, hardware and doors, and changes over time must be made available before decisions are made about restoration, repair or renovation. An additional staff member is needed in order to conduct the necessary research and supervise implementation of the restoration plans for each building. In addition, there is substantial interest among scholars and the public regarding the history of the monumental structures that house the Institution's collections. It is important that the Institution have available information that will aid in understanding the history of the design, construction and use of the buildings. An illustrated history of the buildings followed in later years by a series of pamphlets for each building would be one more area of responsibility for the new staff member. Present staff is inadequate to fulfill this function. For FY 1989 an architectural historian (1 workyear and \$29,000) is requested to perform the necessary research, write and edit the publications, and work with Smithsonian staff in using the information for the implementation of the restoration plans.

Office of Financial Management and Planning (1 workyear and \$500,000) - For FY 1989 an increase of 1 workyear and \$100,000 is requested to fund an existing base deficiency for director for financial planning. This position supervises the Financial Systems Development Division, which has the responsibility for implementation of new financial systems for the Institution. The balance of \$400,000 is requested to continue and complete the Institution's implementation of integrated financial management systems. Beginning in FY 1985, and in concert with directives from the Office of Management and Budget, the Department of the Treasury, and the General Accounting Office, the Smithsonian began a carefully planned program of financial systems replacement that consisted of three stages. Since the predominant investment of \$1.5 million plus staff time will be made with non-appropriated Trust funds, and given the Institution's combination of Federal and non-Federal funds, it is logical that appropriated funds contribute to the completion of the implementation as advocated by the Joint Financial Management Improvement Program's Small Agency Financial Standardization Initiative. These funds will be used for contractual services for final package modifications, training and system documentation.

Office of Accounting and Financial Services (5 workyears and \$94,000) - An increase of 5 workyears and \$94,000 is sought for staffing requirements that exist in accounts payable, account reconciliations, accounting procedures and data entry. These positions are needed due to substantial increases in the volume of financial transactions and activities which are a result of Institution-wide growth. From FY 1984 to FY 1986, the volume of financial transactions increased by 10 percent. Total Federal expenditures increased by \$23 million or 13 percent and are expected to grow another 10-15 percent by FY 1989 with the opening of the Museum of African Art and the Sackler Gallery on September 28, 1987. To maintain bill paying in a timely fashion and control standards, 2 workyears and \$35,000 are needed for the accounts payable program. To ensure that internal controls are appropriate and efficient, an increase of 2 workyears and \$40,000 is needed for account reconciliations and documentation of accounting procedures. An increase of 1 workyear and \$19,000 is needed to maintain acceptable production schedules for entry of data into the accounting system.

Office of Information Resource Management (2 workyears and \$68,000) - For FY 1989 an increase of 2 workyears and \$68,000 is requested to perform mainframe systems software duties in support of all areas of automation. Systems software consists of the computer operating system, data base management systems, general-purpose

utilities, diagnostic programs and other "behind-the-scenes" programs. Since the IBM system was installed, the number of distinct software components has increased from 19 to 29. The number of data bases supported has increased to seven in FY 1987 and seven additional data bases are anticipated in FY 1989. Users of the system have increased to several hundred with hundreds more on the horizon.

Two technical specialists are presently available to meet this growth. Although their duties cover many other areas, the principal areas are: 1) installing and maintaining currency of software, 2) consultation related to usage (for all users throughout the Institution), 3) diagnosis and resolution of system malfunctions that may derive from software or hardware inadequacies and 4) research and development of a project nature which provide increased levels of utility of the resource (e.g., performance monitoring and tuning, and development/acquisition of software capabilities). All of these tasks are essential to the development and operational aspects of the Office of Information Resource Management services.

The addition of two support positions will reverse a present trend of work delays and address new requirements such as performance monitoring and capacity management. A secondary payoff will derive from the ability of these technical support personnel to fill in for the technical specialists when absent for any reason (without backup coverage, the Institution is exposed to extended system capability outages) and to provide a potential replacement source should there be turnover in the senior staff.

Personnel Payroll System (\$100,000) - The Institution has entered into an agreement with the Department of Agriculture's National Finance Center for computer services in support of personnel management, payroll production and attendant records' maintenance and reports' preparation. Phase I of the new system, the preparation of the bi-weekly payroll, became operational at the beginning of FY 1988. When fully implemented this system will provide responsive and accurate information, tighter internal controls and vastly improved information for use by bureaus and offices. Operational costs are funded proportionately with appropriated dollars provided in the FY 1988 appropriation and Trust funds for those employees. With regard to the system itself, however, Trust funds, in the approximate amount of \$900,000, have paid for development to date. These funds have allowed personnel, payroll and accounting requirements to be identified and specified to the National Finance Center, programming to be done to meet the Institution's special needs, particularly for its Trust employees, some equipment and software to be purchased and assistance to be obtained from consultants. Since the preponderance of the need for the system is represented by civil service employment, for FY 1989, an amount of \$100,000 is requested to extend the present direct access to and use of the data base, now largely limited to the central personnel and payroll offices, to the museum and other administrative offices. This will give those offices quick access to their data for planning, budgeting and monitoring purposes. Funds will be spent on communications connections being planned in the current year.

Office of Personnel Administration (4 workyears and \$126,000) - An increase of 4 workyears and \$126,000 is requested to increase the quality and efficiency of personnel services, strengthen Institution personnel programs, keep pace with projected growth in Institution employment, and continue to adapt to new and changing personnel programs, laws and regulations.

Despite the diversity of the organizations and positions serviced, the Institution's of employee population to personnel staff remains exceptionally high as compared with other agencies. The personnel office is reorganizing, making greater

use of automation, and developing further policy and procedural guidance in order to use its current staff even more productively. However, the Institution will need two additional personnel workyears to serve the Institution's increasing population, absorb the additional work resulting from new programs (such as the Thrift Savings Plan with its attendant investment and loan variations), and manage the newly implemented payroll/personnel system.

The third additional staff member will help develop more innovative and effective approaches to staffing services. The Institution must hire and retain individuals in a variety of research, highly specialized or otherwise hard-to-fill positions. The Institution is assessing the desirability of special pay rates for some positions and is seeking delegated hiring authorities for a range of key positions (including scientific, museum specialist, animal keeper, exhibits and guard positions). The additional staff member will also enable the personnel office to devote additional effort to improving its affirmative action and student employment programs.

The new payroll/personnel system's programming requirements, and the burgeoning automation of personnel operations, information management, and communications, have engendered an urgent need for computer expertise beyond that currently available in the personnel office. The fourth additional workyear will enable the personnel office to hire a senior computer specialist.

Office of Procurement and Property Management (2 workyears and \$126,000) - An increase of 2 workyears and \$126,000 is sought to provide support for the purchasing and contracting workload of the Office of Procurement and Property Management which has increased significantly due to institutional growth. In FY 1984, approximately 10,000 Federal and Trust transactions at a cost of \$78 million were processed; in FY 1987, these totals increased to 18,000 transactions at a cost of \$104 million. In addition, the purchasing and contracting process has become more demanding both in terms of more complex subject matter, such as the acquisition of automated systems, and more stringent regulations as established in the Competition in Contracting Act, P.L. 98-369. While the Office's own efforts to automate its processes and to otherwise become more efficient and effective have helped, current staff requirements do not meet workload needs. Over this same period, the number of purchasing and contracting staff, including the additional Trust-fund staff provided, has increased from 16 to 21.

A consultant study in FY 1987 called attention to the high volume and complexity of the Office's activities and complimented it on its competence and responsiveness. For present and future challenges, however, the consultant strongly recommended reorganization of the Office and the addition of senior supervisory and technical personnel. One such managerial position to directly oversee and coordinate major procurement was provided in the FY 1988 appropriation. To complete the reorganization and implement the study's recommendations, two additional senior staff are requested for FY 1989. These are a manager to direct supply purchases, property management and office systems and a contract specialist to handle automated data processing procurement.

Office of Environmental Management and Safety (6 workyears and \$400,000) - An increase of 6 workyears and \$400,000 is requested to continue a phased program to bring Smithsonian operations into compliance with laws and regulations aimed at protecting facilities, staff and visitors from safety and environmental hazards. These resources, as described below, will be used for environmental protection and

occupational health, hazard communication, radiation protection, environmental compliance, fire protection and safety training.

-- Environmental Protection and Occupational Health Program (1 workyear and \$65,000) - This requested increase will provide the resources necessary to hire a senior-level environmental engineer who will have the training and breadth of experience necessary to manage the Smithsonian's Environmental Protection and Occupational Health programs. Both of these areas have been dramatically affected by regulatory activity in the last few years. In an effort to bring the Institution into compliance with these regulations as effectively and expeditiously as possible, some existing resources have been specifically concentrated in a newly created Environmental Management Division. Without the requested new position these programs will continue to be operated in a fragmented and ineffective manner and without the assurance of compliance with applicable statutes and regulations within reasonable time periods.

-- Hazard Communication Program (1 workyear and \$164,000) - In FY 1988, \$60,000 has been provided for the Hazard Communication Program to begin to meet the legal requirements for such efforts as imposed by the Occupational Safety and Health Administration (OSHA). It is estimated that the Smithsonian has some 100,000 such items for inventory and appropriate employees will require training in the use of these substances. The resources being sought for FY 1989 will permit the implementation of phase two of the program which would allow the hiring of a safety engineer to manage the program, provide funds for the development and implementation of a comprehensive employee training program, and cover the cost of a computerized data base of chemical inventories within the Smithsonian. This requested new position, along with the one provided in FY 1988, will allow the Smithsonian to comply with the recently expanded Hazard Communication Standard (29 CFR Part 1910.1200) which now encompasses all employers, including Federal agencies. No longer a voluntary program, this regulation requires the Smithsonian to provide adequate training to employees who work with hazardous chemicals and to assure that it maintains a safe and healthful work environment for its employees and volunteers.

-- Radiation Protection Program (1 workyear and \$52,000) - This requested increase is designed to implement the first phase of a three-phase Radiation Protection Program. The first phase of the program will involve the hiring of an environmental specialist who is specially trained in the highly technical field of radiation protection, procuring the instrumentation necessary to evaluate radiation exposures, and the placing of a laboratory analysis contract to examine samples for radiation contamination. Beginning in FY 1989, the first phase will involve the survey, by the environmental specialist, of all Smithsonian facilities where radioactive artifacts, radioisotopes used in research and x-ray machines are located. A comprehensive inventory of all radiation sources in the Institution will be compiled along with storage, use and disposal information concerning the status of Nuclear Regulatory Commission (NRC) licenses, and other legal requirements of applicable federal, state and local regulations. The second phase of the program, to be initiated in FY 1990, will include the development of radiation protection training programs within the Smithsonian, with actual presentation of the training, phase three, to take place in FY 1991. With full implementation the Smithsonian will comply with the requirements of 10 CFR 20 and, upon NRC inspection, avoid fines, revocation of licenses and other enforcement measures. The potential for adverse publicity and unnecessary radiation exposure to employees and visitors requires that the Radiation Protection Program be implemented as quickly as possible.

-- Environmental Compliance (1 workyear and \$35,000) - A high priority requirement of the Office of Environmental Management and Safety (OEMS) is to begin a comprehensive environmental compliance program. The resources requested in FY 1989 to initiate this effort allow OEMS to hire an environmental specialist who would be responsible for first-phase coordinative activities which will primarily involve the initial review of Smithsonian facilities and the writing of technical specifications which will form the basis for full environmental audits to be conducted through contract with outside firms, using Federal funds to be sought for FY 1990. This audit will encompass a systematic and objective review of all Smithsonian facilities by evaluating policies and practices and recommending corrective actions to meet environmental requirements. The contracted phases of the audit will be accomplished over several years. Compliance status will be determined for each facility or operation and will include an analysis of compliance with state and local regulations as well as federal environmental statutes. Without the knowledge of how each environmental statute applies to Smithsonian operations and buildings, the effective establishment and implementation of an Environmental Management Division will be virtually impossible.

-- Fire Protection Engineer (1 workyear and \$42,000) - The requested increase will permit the hiring of a fire protection engineer necessary to meet the Institution's statutory requirement to ensure full compliance with OSHA regulations (which include many requirements for protection of staff from fire). The services to be provided by the allowed FY 1988 fire protection engineer position as well as this requested position will include the review and approval of all construction, renovation and exhibit plans to ensure compliance with applicable codes and regulations; performance of fire protection systems acceptance tests; annual facility surveys; evaluations of hazardous operations; and assistance in the preparation of Fire Protection Master Plans; and the extension of the Office's outreach efforts through the publication of fire safety informational brochures and magazine articles which benefit outside cultural and educational institutions and organizations.

-- Safety Training Program (1 workyear and \$42,000) - This budget request is designed to establish a formal safety training program to bring the Smithsonian into compliance with the requirements of 29 CFR 1910, 29 CFR 1926 and 29 CFR 1960. Each of these Occupational Safety and Health Regulations is composed of dozens of standards, many of which require the training of employees in a variety of safety related subjects. For example, employees who are assigned collateral safety duties must receive training to enable them to effectively carry out the program elements required by Federal regulations. Employees exposed to specific hazards in the workplace, such as those who work with asbestos or are exposed to high noise levels, must receive such specialty training. In addition, 29 CFR 1960 requires that all managers and supervisors receive supervisory-level safety training and that safety committee members be trained to inspect facilities for safety hazards. In addition to the regular curriculum mandated by OSHA, and the specialty training for targeted employees, focused training in response to accident and injury statistics, analysis must be conducted to address evident needs. An intensive training program in back injury prevention in response to an identified need is an example of focused training. Without a full-time staff whose efforts are directed towards managing a complex safety training program, such efforts would be piecemeal at best and would not meet federally mandated requirements.

Funds totaling \$639,000 and 13 workyears for management and technical costs associated with the enhancement of the Smithsonian's repairs and restoration programs are being requested for the Offices of Environmental and Safety (2 workyears and

\$106,000), Procurement and Property Management (8 workyears and \$425,000), Personnel Administration (1 workyear and \$42,000) Accounting and Financial Services (1 workyear and \$20,000), and Audits and Investigations (1 workyear and \$46,000). The justification for these funds and other administrative costs is contained in the Repairs and Restoration section of this budget request.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - Funding of these centralized services from both appropriated and nonappropriated sources produces a ratio of Federal and Trust fund administrative support approximately in proportion to the programmatic salaries expenditures of the entire Institution. The amounts shown under Unrestricted General represent administrative expenditures for those units that are organizationally under Administration. Certain other units receiving administrative allotments are reflected in the appropriate section of the budget request. For example, administrative costs for the Smithsonian Astrophysical Observatory are reflected within its nonappropriated Trust funds section. Also included are expenditures for producing, distributing and marketing photographic material and slide sets, and funds to help defray the costs of the Office of Printing and Photographic Services. A program allotment is made to the Office of Equal Opportunity to support community outreach through exhibits and publications, specifically aimed at women and minorities. Funds also are provided for the costs of the identification and implementation of new financial and administrative management systems. Special Purpose funds include gifts received through unrestricted bequests which in accordance with the Bylaws of the Board of Regents subsequently are transferred to endowment. Anticipated expenditures in the Special Purpose category include support of studies in ornithology, computer conversion costs, a computer cost center and small amounts used for legal seminars, and research.

Restricted Funds - Included in this category are endowment bequests and foundation grants for scientific research publications and general research projects.

OFFICE OF DESIGN AND CONSTRUCTION

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	38	2,005	9	388	-	64	-	-	-	-
FY 1988 -Estimate	35	2,250	9	468	-	50	-	-	-	-
-Base	35	2,277								
FY 1989 Estimate	48	2,920	9	447	-	-	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	35	13	48
11 Personnel Compensation.....	1,484	375	1,859
12 Personnel Benefits.....	257	114	371
21 Travel.....	15	7	22
23 Rent, Communications & Utilities.....	24	65	89
24 Printing & Reproduction.....	10	-	10
25 Other Services.....	319	60	379
26 Supplies & Materials.....	25	12	37
31 Equipment.....	143	10	153
Total	<u>2,277</u>	<u>643</u>	<u>2,920</u>

Analysis of Increase

Necessary Pay.....	27
Program Funds.....	616

ABSTRACT - The Office of Design and Construction (ODC) provides professional architectural and engineering services to the Institution in support of the development, operation, maintenance, repair, and improvement of the physical plant. Services include short- and long-range planning feasibility analyses, design and engineering studies, design development, contract document preparation, project management, contract administration, and development of cost and budgetary estimates. Other services provided by ODC include contract review, construction field office operations, interior design and space planning, and technical consulting support. The FY 1989 Salaries and Expenses estimate reflects a decrease of \$75,000 associated with

nonrecurring expenditures in the FY 1988 base for the purchase of equipment and software for the automation of an information management and production scheduling system.

Funds totaling \$691,000 and 13 workyears for management and technical costs associated with the enhancement of the Smithsonian's repairs and restoration programs are being requested for the Office of Design and Construction. The justification for these funds and other administrative costs is contained in the Repairs and Restoration section of this budget request. Necessary pay of \$27,000 is required for existing staff.

PROGRAM - The primary functions of the Office of Design and Construction are to provide planning, engineering, architectural, construction management, and related administrative services for all construction, renovation, and repair projects for the Smithsonian facilities. The facilities are located primarily in the Washington metropolitan area, as well as the Smithsonian Environmental Research Center near Edgewater, Maryland; the Whipple Observatory in Arizona; the Cooper-Hewitt Museum in New York; the Astrophysical Observatory in Massachusetts; and the Tropical Research Institute in Panama. ODC's staff includes electrical, mechanical, structural, and civil engineers, architects and construction managers, computer specialists, planners, estimators, technicians, and administrative support personnel.

The major responsibility of the Office is to administer the Repair and Restoration (R&R) and Construction programs by providing professional and technical support that addresses the facilities needs of the Institution in a cost-effective manner. The R&R Program is designed to preserve and rehabilitate an aging physical plant, correct code violations and provide a safe habitat for visitors and staff, and to provide proper environmental conditions for the preservation and maintenance of the National Collections.

Staff services provided by the Office include the preparation of contract documents (designs, specifications, and cost estimates) for construction services, master facility plans and analyses, and related budget justifications for requested R&R and Construction Programs. In FY 1987, ODC provided services in support of an estimated \$40,000,000 in various facilities projects, including exhibition projects. These funds were committed during the fiscal year and derived from Construction and R&R appropriations, Salaries and Expense appropriations and Trust funds. Some of the major projects for which funds were committed included the final phase of the Arts and Industries exterior renovation, the Freer Gallery alterations and Quadrangle connection, the Air and Space Museum Terrace Restaurant, the Tupper Laboratory and Conference Center, the Mathias Laboratory and Greenhouse, exterior repairs and roof replacement at the Museum of American History, and replacement of PCB transformers at various locations. In addition to current year activity, ODC planners and design staff professionals prepared preliminary facility requirement data and plans for future year projects estimated at \$575,000,000 in construction costs, including detailed plans for the Whipple Observatory Base Camp and facility development at the Tropical Research Institute, preliminary plans for contemplated expansion of the Hirshhorn Museum and the Silver Hill storage facility, and possible construction of a museum and support facilities to house the Museum of the American Indian.

During FY 1987, 116 construction services contracts and 39 architectural and engineering services contracts were administered by the ODC staff. In addition, 80 exhibit installation projects were reviewed and 33 interior design and space related projects were supervised.

Also, expertise is provided to Smithsonian managers on matters relating to planned construction and facility development and utilization. To support these aggregate functions, ODC maintains numerous files of documents, cost data, plans, technical specifications, and drawings of past and current facility projects and programs for all of the Institution's buildings and sites.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These funds are provided by an allotment used to cover salaries and partial support costs as ODC provides services for both Trust and Federally funded programs.

OFFICE OF PROTECTION SERVICES

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	654	18,814	-	119	1	-29	-	-	-	-
FY 1988 -Estimate	732	19,369	-	8	1	93	-	-	-	-
-Base	732	19,620								
FY 1989 Estimate	757	20,717	-	8	1	94	-	-	-	-

* FTE = Full-time equivalent

** FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	732	25	757
11 Personnel Compensation.....	14,549	837	15,386
12 Personnel Benefits.....	1,553	209	1,762
21 Travel.....	38	-	38
22 Transportation of Things.....	3	-	3
23 Rent, Communications & Utilities.....	30	-	30
24 Printing & Reproduction.....	10	-	10
25 Other Services.....	2,781	13	2,794
26 Supplies & Materials.....	320	9	329
31 Equipment.....	331	29	360
42 Insurance Claims & Indemnities.....	5	-	5
Total	<u>19,620</u>	<u>1,097</u>	<u>20,717</u>

Analysis of Increase

Necessary Pay.....	284
Program Funds.....	813

ABSTRACT - The Office of Protection Services (OPS) protects the visitors, staff, collections, and facilities of the Smithsonian Institution by providing guards, physical security, and medical services. The authority of OPS to provide these services is derived from Public Law 82-206 and Public Law 88-391, which relate to the policing of Smithsonian buildings and grounds, and from Public Law 91-616, which relates to employee health.

For FY 1989, a total of 22 workyears and \$813,000 is requested to provide additional security personnel, as a result of the restructuring of the exhibits galleries and garden area of the Quadrangle (10 workyears and \$221,000); to provide security coverage at the newly acquired General Post Office Building (12 workyears and \$282,000); and for the restoration of base resources (\$310,000).

Necessary pay of \$ 243,000 is required for existing staff, along with 2.75 workyears and \$41,000 required to annualize the partial-year funding of 11 new positions approved in the FY 1988 budget.

PROGRAM - The Office of Protection Services is a support organization responsible for protecting the collections, facilities, and other property of the Smithsonian from damage, destruction, or loss from any cause; protecting staff and visitors from personal injury; and creating and maintaining a secure environment for visitors and staff. Included within this broad mission is a responsibility for determining the protection requirements of Smithsonian facilities and meeting these requirements by operating a guard force; procuring, installing, and maintaining an alarms network and responding to its signals; installing and maintaining locks and other security hardware in Smithsonian facilities; planning and providing health services for employees and taking appropriate action to eliminate health hazards from the workplace; and providing emergency medical treatment for the injuries and sudden illnesses of visitors and staff.

OPS provides security management, guarding, investigative, and occupational medicine services to the Cooper-Hewitt Museum in New York City and to the major Smithsonian facilities in Washington, D.C., including 14 museums and art galleries, and provides technical assistance and advisory services in security matters to all Smithsonian bureaus. To accomplish its mission, OPS employs a large force of security officers and a staff of administrators, training specialists, alarm systems specialists and technicians, investigators, museum security specialists, a medical officer, nurses, and emergency medical technicians.

The security force operates 24 hours-a-day, every day of the year, to patrol and provide access control at the Cooper-Hewitt Museum and at major facilities in or near Washington, D.C. Uniformed guards, plainclothes officers, and K-9 officers are stationed at entrances and patrol galleries inside and grounds around Smithsonian buildings day and night. They respond to emergencies; operate and respond to the signals of an alarms network that covers all Smithsonian facilities including the National Zoological Park, and the Smithsonian Mail Order Center in Springfield, Virginia; conduct security and fire patrols after the museum buildings are closed to the public; investigate accidents; report fire and safety hazards and malfunctions associated with mechanical and electrical equipment; escort valuable art shipments; and provide information to museum visitors. Protection arrangements, especially those related to dignitaries' visits and exhibitions of international interest, must be coordinated with and supported by the State Department, the Secret Service, the U.S. Park Police, and other Federal and local agencies. For the past several years, OPS has concentrated on reducing the number of thefts committed in Smithsonian facilities by posting plainclothes officers in areas of high crime rate, by providing intensified training in police methods and security practices for its officers, and by thoroughly investigating incidents.

The training of museum security officers is a specialized area in which OPS takes pride and which has gained renown in the museum community. Training staff instructs all new guards (including K-9), prepares guards for higher level officer positions,

and conducts refresher courses for the force. Over the past several years, the staff has trained K-9 teams from Fairfax and Loudoun Counties and Falls Church, Virginia; Kanawa County, West Virginia, and the Annapolis, Maryland, Police Department, as well as guards and guard supervisors from Detroit Institute of Art, Museum of New Mexico, Virginia Museum of Fine Arts, U. S. Air Force Museum, Amon Carter Museum of Art of Fort Worth, High Museum of Art in Atlanta, National Aquarium of Baltimore, Bishop Museum of Hawaii, as well as others across the United States. OPS assists the Institution's Office of Museum Programs in providing training in security for small museums across the United States. Every year OPS hosts a large museum security conference that has become international in attendance. And for the past several years, OPS has played a leading role in worldwide efforts to improve security of cultural objects.

An expansive network of locks, alarms, and other devices is necessary to control access to and to protect Smithsonian facilities and property. OPS advises curators and exhibitors on appropriate security systems, as well as plans, designs, acquires, installs and maintains security systems in Smithsonian facilities in the Washington metropolitan area. In addition, OPS provides advice on security systems for facility, exhibit and collection protection to Smithsonian organizations outside Washington and to museums, libraries, churches, historic sites and corporations.

OPS has been developing the Smithsonian Institution Proprietary Security System (SIPSS) to provide complete internal control of the equipment used in and the information provided by its security systems, to improve the timeliness of OPS response to the signals received through its alarm installations, and to control the costs associated with operating a security system. Installation of the SIPSS has been completed at the Museum Support Center and the Paul E. Garber facility in Suitland, Maryland, and on the Mall at Hirshhorn, Quadrangle, and American History building. The system now has been expanded to all Washington-area facilities. Over the next two years all of the remaining old security systems will be converted to the SIPSS.

OPS conducts or arranges for security management surveys to determine protection requirements of Smithsonian facilities, investigates alleged and actual violations of the law occurring on Smithsonian premises, and escorts many shipments of valuable objects to and from the Smithsonian. The investigative program is designed to resolve collection losses, thefts, and other serious internal matters. Similar investigative assignments impacting on the retail operations of the Smithsonian Institution are also referred for advice and investigative attention. Successful resolution of collection losses and thefts requires coordination with the United States Attorney, the Department of Justice, and the court system.

OPS provides occupational medicine services and counseling for Smithsonian employees. The medical officer, occupational health nurses, and emergency medical technicians assist in identifying and eliminating hazardous work environments, monitor the health of employees exposed to occupational hazards, and provide first aid for on-the-job injuries of employees. There were 23,218 visits to the health units last year. Major program elements include general protection and monitoring of employees who are exposed to various specific hazards such as asbestos, loud noise, pesticides and other toxic chemicals; medical evaluation of individuals selected for certain hazardous jobs or for certain job duties or functions such as underwater diving (102), employee assistance counseling to deal with alcohol, substance abuse and emotional problems; routine medical treatments such as allergy shots (968), flu shots (635), and dressing changes, prescribed by an employee's private physician to reduce the amount of time employees must spend away from the workplace for simple health care; required

immunizations for Smithsonian employees on official travel orders (349); health education and major disease screening programs and CPR (153); and first aid training for employees (127) including special first aid training for scientific expedition members (6) traveling in medically remote areas. OPS provides occupational medicine services at the Washington-area facilities and at other major remote facilities.

The occupational medicine program has been expanding rapidly since April 1983, when OPS appointed its first full-time medical officer. Occupational health units are operated in National Museum of American History, National Museum of Natural History, National Air and Space Museum, National Zoological Park, Museum Support Center, and Hirshhorn Museum and Sculpture Garden. Health services are available to employees in other facilities during regular visits by members of the health staff. OPS has acquired new equipment and developed a new examination program for the increasing number of employees identified as being at risk from exposure to asbestos and other toxic substances. Audiometric examinations (459) were given to employees for whom a hearing conservation program is required. Hearing protection devices were also provided. OPS will continue to develop the occupational health programs it is already operating and will undertake additional required programs when the additional space needed to administer these programs is provided. The programs expected to grow most rapidly are employee assistance counseling, monitoring of toxic chemical exposed employees, diabetes screening, glaucoma testing, cholesterol testing, and preemployment physicals. There is also a need to promote voluntary screening programs more heavily, to increase employee participation and to conduct these programs at the Cooper-Hewitt Museum and the Smithsonian Astrophysical Observatory more frequently.

OPS reviews medical qualifications of those planning to dive, performs physical examinations of divers, represents Smithsonian on appropriate committees of national diving organizations especially with regard to scientific diving, and provides liaison on medical aspects of scientific diving with Federal agencies, legislative committees and scientific societies.

OPS is now conducting stringent inspections of all Smithsonian museums and National Zoological Park food service facilities and requires testing of all food handlers for tuberculosis. Additionally, OPS has expanded its counseling program for employees with alcohol, drug abuse, or emotional problems which effect employee work performance bringing it into full compliance with the requirements of Public Law 91-616. A member of the OPS staff who is a certified counselor is now available to employees on a full-time basis. The number of referrals is increasing dramatically as this service is publicized more widely to employees and supervisors and as extensive training programs are conducted for management personnel.

EXPLANATION OF PROGRAM INCREASE:

Quadrangle Staffing Requirements - (10 workyears and \$221,000) - For FY 1989, an increase of 10 workyears and \$221,000 is requested to provide additional security personnel for this area. In FY 1988, 67 guards will be available for security in the Quadrangle. An increase of 10 workyears is requested to accommodate the final design of the exhibit galleries in the Quadrangle. The original design (done before curators and exhibit staff were hired) of the Oriental exhibit galleries and the Southwest exhibit galleries, first level, required four guard posts. As plans progressed, these galleries were redesigned to become more appropriate for the art objects and were divided into nine separate galleries, which also includes a mezzanine gallery. To provide adequate guard coverage for these galleries, seven posts are now required. The additional three posts will require five workyears.

The original design of the African Art exhibit galleries and the Southeast exhibit galleries, first level, required four guard posts. The necessary restructuring of these galleries into several small exhibit areas has increased the needed posts to seven. The additional three posts will require five workyears.

The number of required posts is determined by many factors including crowd conditions, value of objects on display, the vulnerability of those objects to accidental damage, vandalism, or theft, and the effective field of vision of the assigned protection personnel. The redesign of these exhibit areas has reduced the field of vision to very small areas, and the vulnerability of the objects on display to vandalism or theft has been greatly increased. The number of guards required to staff one post eight-hours-a-day, seven-days-a-week is 1.67 guards. This allows for breaks, lunch, leave, and training time over a one-year period. Therefore, six additional posts will require 10 workyears.

In FY 1990, additional funding and 10 workyears will be requested for security personnel. Additional personnel also will be needed to provide coverage for the Kiosk, one post on the third shift, three posts for the garden, and two supervisory posts.

General Post Office Building Staffing Requirements (12 workyears and \$282,000)- For FY 1989, an increase of 12 workyears and \$282,000 is requested to provide security coverage at the newly acquired General Post Office Building. The Office of Protection Services must provide security coverage in a limited "caretaker" capacity for the building seven-days-a-week, 24-hours-a-day.

As a caretaker operation, one supervisory and three nonsupervisory guard posts on the first relief, and two nonsupervisory guard posts will be required on the second and third reliefs to maintain an adequate security posture. These positions will allow the building to be patrolled on each relief to guard against potential problems such as fire, theft, and vandalism. Outside patrols will be performed periodically to protect the building against vandalism. The security force will be incorporated with an existing security force to reduce the number and level of supervisors required. A perimeter security system will be installed from existing security equipment upgrade funds and connected to the Smithsonian Institution proprietary security system.

The requested increase of 12 workyears and \$282,000 includes \$45,000 for basic security supplies, laundry and dry cleaning, uniforms, lockers, and radio equipment. The one-time costs for lockers and radio equipment will be used in the following years for maintenance of uniforms, equipment, and alarm systems.

When the building is renovated and increased operations begin, additional security personnel will be required. The required number of workyears and funding will not be known until more specific plans for the building's use have been developed. Access for the public, exhibit areas, storage areas, and numerous other factors will be the determining factors for the amount of increase to be requested.

Restoration of Base Resources - (\$310,000) - For FY 1989, an increase of \$310,000 is requested to provide funding for 13 guard positions previously authorized by Congress and the purchase of essential equipment, supplies, and services needed to support these positions. In recent years, these positions have had to remain vacant due to insufficient funds. Each year since FY 1986, funding for these positions has been requested. The funding of these positions would eliminate the need to close

exhibition galleries and other spaces as the result of understaffing and would provide adequate coverage for regular operations.

With the restoration of the base shortage and the final increment of the Quadrangle security personnel, the critical guard shortage will be 75. The continued understaffing of the security force increases the risks for thefts and vandalism to the collections and visitors. Night time security coverage has been maintained at absolute minimum levels in order to keep the day time security operation at the highest level of personnel.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - These are provided by an allotment and by reimbursements for the use of guard services at special events and lectures at Smithsonian facilities. These funds are used to purchase supplies, materials, and equipment.

OFFICE OF PLANT SERVICES

(Dollars in Thousands)

Fiscal Year	APPLICATION OF FUNDS									
	FEDERAL FUNDS		UNRESTRICTED FUNDS				RESTRICTED FUNDS		GOV'T GRANTS & CONTRACTS	
			General		Special					
	FTE*	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount	FTP**	Amount
FY 1987 Actual	432	35,175	7	1,197	7	329	-	3	-	-
FY 1988 -Estimate	490	36,026	6	989	8	131	-	-	-	-
-Base	490	36,246								
FY 1989 Estimate	503	37,654	6	985	7	122	-	-	-	-

* FTE = Full-time equivalent

**FTP = Full-time permanent

Detail of Federal Funding

	<u>Base FY 1988</u>	<u>Proposed Adjustments</u>	<u>Est. FY 1989</u>
FTE Allocation.....	490	13	503
11 Personnel Compensation.....	12,553	470	13,023
12 Personnel Benefits.....	1,690	141	1,831
21 Travel.....	25	-	25
22 Transportation of Things.....	2	-	2
23 Rent, Communications & Utilities.....	18,446	737	19,183
24 Printing & Reproduction.....	5	-	5
25 Other Services.....	1,772	10	1,782
26 Supplies & Materials.....	1,359	30	1,389
31 Equipment.....	394	20	414
Total	<u>36,246</u>	<u>1,408</u>	<u>37,654</u>

Analysis of Increase

Necessary Pay.....	221
Program Funds.....	450
Utilities, Postage, Rent & Communications..	737

ABSTRACT - The Office of Plant Services (OPlants) operates, maintains, and repairs 14 museums and art gallery buildings including the Quadrangle, which opened to the public in September 1987, and a number of other work and collections storage areas located in the Washington metropolitan area and New York City. OPlants provides utilities, transportation, and mail services as well as exhibits renovation and other essential program services in support of research, exhibition, education and other

public programs. In addition, technical service and assistance are provided to other Smithsonian units located outside the Washington metropolitan area including the Tropical Research Institute in Panama, the Cooper-Hewitt Museum in New York, the Whipple Observatory in Arizona and the Environmental Research Center in Maryland. Also included in this line item are the Office of Horticulture, South Group Building Management, and the Quadrangle Facility Management units. The Office of Horticulture is responsible for the management of the Smithsonian Institution grounds and providing horticultural assistance to Smithsonian bureaus. The operation of the greenhouse-nursery facility supports these horticultural needs of the Smithsonian. In addition, educational outreach is provided through lectures, seminars, and horticultural exhibitions. South Group Building Management is responsible for a full-range of maintenance services for the Arts and Industries and Smithsonian Institution Buildings. The Quadrangle Facility Management is responsible for a variety of maintenance support services for bureaus located in the Quadrangle building.

For FY 1989, an increase of 11 workyears and \$390,000 is requested to provide sufficient base funds for salaries, supplies, services and equipment in support of the Office of Plant Services facilities operations, maintenance and repair personnel.

A further sum of 2 workyears and \$60,000 is requested for the Office of Plant Services to allow for adequate staffing and provision of supplies, equipment and services to support the Smithsonian's acquisition of the Old General Post Office Building.

Necessary pay of \$ 215,000 is required for existing staff, along with .25 workyear and \$6,000 required to annualize the partial-year funding of 1 new position approved in the FY 1988 budget. An amount of \$737,000 to support the Institution's utilities, postage, rent and communications costs is being requested and justified in the Uncontrollable Increases section of this budget.

PROGRAM - I. Office of Plant Services - The Office operates, maintains and repairs the Smithsonian's physical plant on or near the Mall, including over 5.1 million net usable square feet in museums and art galleries. In addition, OPlantS operates, maintains and repairs 82,000 square feet of space in the Cooper-Hewitt Museum in New York City. The Office of Plant Services provides maintenance of building interiors and exteriors; mechanical and electrical equipment including elevators and escalators; lighting and refrigeration components; and oversight of emergency property repairs which are accomplished by service contracts. Trade and craft support includes plumbing, painting, woodcrafting, plastering, sheet metal and electrical work which are provided in support of OPlantS' efforts directed toward furthering research projects, office relocations and modifications, exhibition installations and public events in all facilities.

The Computerized Facility Monitoring System continues to analyze and control mechanical equipment and monitor environmental conditions in major Smithsonian buildings. This System monitors those areas of the buildings that require stable humidity and temperature conditions, and alerts a control center when deviations from normal conditions occur. This prompt alert to abnormalities allows immediate adjustments to be made, thereby avoiding costly repairs that would otherwise be necessary to maintain the proper environmental conditions within the buildings.

The Computerized Preventive Maintenance System which is used for scheduling preventive maintenance on operating systems in Smithsonian facilities continues to

provide reliable and efficient information regarding physical plant operations. Preventive maintenance is scheduled for fire prevention systems, guard stations, automatic lighting, roofing systems and heating, ventilating and air conditioning mechanical equipment located in all museums and the Environmental Research Center near Edgewater, Maryland. Regular preventive maintenance on these systems assures longer life, increased reliability and decreased repair costs.

A supply warehouse at the Smithsonian Institution Service Center is maintained by the Office of Plant Services to stock and distribute frequently used supplies and materials. These materials are purchased in bulk, to obtain the most favorable prices, and stored at the Service Center for future distribution. OPlantS also offers packing, crating, warehousing and moving services for museum objects and collections, as well as support for office relocations and modifications. In addition, OPlantS is responsible for providing transportation services for the Institution, including maintenance, repair and operation of Smithsonian vehicles, as well as the processing of mail and the monitoring of postage costs.

In FY 1987, OPlantS provided essential program support services to museums and other Smithsonian organizations. These projects included: preparation of exhibition halls to accommodate modifications for new exhibition installations; renovation of office space to accommodate changing program needs; pilot project installation of a computer controlled exhibit lighting system; initiation of a building inspection program to assure prompt attention and repair to those areas in need; continued environmental analysis in major museums by the facility monitoring equipment to assure stable temperature and humidity controls; installation and maintenance of fire detection and suppression systems; and preparation of the Quadrangle for occupancy by staff and the public.

Significant accomplishments in FY 1987 included providing trade and craft support such as electrical, plumbing, woodcrafting, painting and machinist in support of more than 50 exhibit projects for Smithsonian organizations. Notable among these were: "Portraits of Nature" at the National Museum of Natural History; "Engines of Change" and "Field to Factory" at the National Museum of American History; "Russia, The Land, The People" at the Renwick Gallery of Art; "Recent Acquisitions" and "Nancy Graves" at the Hirshhorn Museum and Sculpture Garden; "Aviation Art" at the National Air and Space Museum; "Time Men of the Year" and "The Rosenquist Exhibit" at the American Art/Portrait Gallery; and the opening of the Enid A. Haupt Garden.

In FY 1988, the communications function of the Office of Plant Services was transferred to the Office of Information Resource Management to allow consolidation of information management throughout the Institution.

II. Office of Horticulture - The Office applies the discipline of horticulture as an educational, scientific, research, exhibition and display activity for the Smithsonian Institution. As such, significant collections of living plants and horticultural artifacts are under its management. The Office provides horticultural services to all Smithsonian bureaus and museums. These services include interior and exterior landscape management as well as design, installation, rotation, and maintenance; research and development of historically styled gardens for museum grounds; and special exhibitions. To assure the quantity and quality of plants needed to fulfill these programs, the Office of Horticulture operates a greenhouse-nursery complex. Responsibilities of the Office also include: pest control, snow and ice removal on and off the Mall, and policing of trash on the grounds.

Accomplishments in FY 1987 included the completion and opening on May 21, 1987, of the Enid A. Haupt Garden. Highlights of this unique rooftop garden are the 19th-century garden furniture, large specimen trees and distinctive water features. The interior plant program installation for the Quadrangle grand concourse and the two museum pavilions was completed in time for the museums' opening in September 1987.

Various Smithsonian museums have requested Office of Horticulture assistance during FY 1987 in providing specific plants for exhibits ("Robert Bateman," National Museum of Natural History; "Ebla to Damascus," National Museum of Natural History; and "New Mexico," National Museum of American Art). Also, the Office has produced specialized exhibits in the North foyer, Natural History Building, featuring grasses, orchids, poinsettias, African Violets, chrysanthemums and tropical plants. The 1987 Folklife Festival utilized vegetable plants and flowers grown by the Office of Horticulture.

Also during FY 1987, a major collection of 65,000 photographic slides and glass plate negatives of "Notable American Parks and Gardens" was donated to the Office of Horticulture by the Garden Club of America. A grant by the Smithsonian Society in FY 1986 of \$15,000 is being used to transfer these images to laser disc. The Office of Horticulture's photographic collection has become a premier resource tool for the study of contemporary and historic gardens, their furnishings, and horticulture in commerce, the decorative arts, and costume.

As part of its educational outreach activities, the Office participated in three regional flower shows in New York, Philadelphia, and Washington, D.C., which were seen by thousands of visitors. The Office received the following awards: (1) "Certificate of Merit," awarded to exhibits demonstrating exceptional educational, design, or horticultural qualities, New York Horticultural Society; (2) "Exhibit of Exceptional Merit," Pennsylvania Horticultural Society; (3) "Contributions to an Exhibit of Exceptional Merit," Pennsylvania Horticultural Society, (for assistance to the Morris Arboretum, University of Pennsylvania exhibit); and (4) "Special Award" and a Revere Bowl, Sponsors of Washington, D.C. Flower Show. In December 1987, the 11th annual "Trees of Christmas" exhibition was mounted in the National Museum of American History. This exhibition featured ten Christmas trees decorated with ornaments both visually beautiful and rich with cultural and regional diversity. The Office of Horticulture will continue to give lectures and is anticipating the production of an updated American Victorian Horticultural Extravaganza exhibition in the Arts and Industries Building.

III. South Group Building Management - The South Group Building Management is responsible for the cleaning, minor maintenance, labor services, relamping, craft services, shipping and receiving, special events, contract coordination for maintenance, trash removal, pest control and renovation projects for the Arts and Industries and Smithsonian Institution Buildings.

IV. Quadrangle Facility Management - This Office provides a wide variety of support services to the Museum of African Art, Arthur M. Sackler Gallery, Resident Associate Program, National Associate Program, Smithsonian Institution Traveling Exhibition Service and the Office of International Activities. These services include shipping and receiving, custodial, labor, rigging, minor maintenance, lamping and other services.

EXPLANATION OF PROGRAM INCREASE - For FY 1989, an increase of 13 workyears and \$450,000 is requested to provide the Office of Plant Services with the resources

necessary to ensure that buildings maintenance and related repair programs keep pace with the increasingly complex demands being placed on an aging physical plant (11 workyears and \$390,000). These funds will also ensure caretaker operations and maintenance of the Old General Post Office Building (2 workyears and \$60,000).

Facilities Maintenance Program (11 workyears and \$390,000) - For FY 1989, an increase of 11 workyears and \$340,000 is requested for additional maintenance mechanics necessary to address the backlog of essential routine maintenance in Smithsonian buildings. The annual facilities inspections, begun in FY 1987, are identifying repairs and essential maintenance to the Institution's aging facilities and systems in order to operate optimally and serve the Institution and the public. This increase will allow additional resources to be directed to the routine correction of inefficient or potentially dangerous situations that are being identified as a result of the inspection program. Without these additional resources the facilities maintenance backlog will continue. Funds are also being requested in the Repair and Restoration account for projects of a larger scale that are also part of the backlog of deferred maintenance.

An additional sum of \$50,000 is required to purchase supplies (\$30,000) and equipment (\$20,000) that will be used by the additional OPlantS' staff in support of reducing the backlog of essential maintenance and making ongoing essential repairs to Smithsonian facilities.

General Post Office Building Acquisition (2 workyears and \$60,000) - For FY 1989, an increase of 2 workyears and \$60,000 is requested to provide two maintenance mechanics to be devoted to the operation and maintenance of mechanical equipment at the Old General Post Office Building as the Smithsonian assumes caretaker responsibility. The additional resources for this new acquisition would allow existing maintenance programs to continue at the current level of operations without hindrance. The presence of these two full-time operating personnel in the facility will allow familiarization with capabilities of the operating systems and will offer the Institution a smooth transition to responsibility for this facility as well as an increased ability to address future operations concerns. Once the building has been renovated and is fully operational a full complement of operating and preventive maintenance mechanics will be requested.

NONAPPROPRIATED SOURCES OF FUNDING:

Unrestricted General and Special Purpose Funds - Unrestricted Trust funds are provided by allotments and are used primarily to cover salaries and support costs in the Office of Plant Services and to provide for the Trust fund share of space rental costs for administrative activities located in L'Enfant Plaza. Special Purpose funds are provided through reimbursements primarily from Trust-funded client organizations for support services rendered. These funds are used to purchase supplies, services, equipment and landscaping materials.

CONSTRUCTION AND IMPROVEMENTS
NATIONAL ZOOLOGICAL PARK

1987.....	\$2,500,000
1988.....	\$8,150,000
1989.....	\$5,305,000

This appropriation is for use at the National Zoological Park for repairs, alterations and improvements to plant property and for the construction of additions to existing facilities and minor new facilities including exhibits; preparation of plans and specifications for construction; and to perform renovations, restorations and new construction for implementing the Master Plan approved by the Commission of Fine Arts and the National Capital Planning Commission in FY 1973. The Zoo's facilities include 163 acres in the Rock Creek Valley of Washington, D.C., and a 3,150-acre Conservation and Research Center located at Front Royal, Virginia. Construction and improvements are accomplished primarily by contract, except in instances when suitable contractors cannot be located or their estimates are above acceptable cost levels in relation to proposed work. In such cases, accomplishment of the work by other means, such as the purchase of supplies, materials and equipment and the use of permanent staff or temporary labor, is the most economical alternative. Occasionally it is necessary to fund other related expenses from this account, particularly those associated with the displacement of animals as a result of the construction program or major grounds maintenance in repair of storm damage.

Status of the Construction Program - The National Zoological Park was established in 1889 under the Board of Regents of the Smithsonian Institution, which was authorized to "administer and improve" the Zoo for "the advancement of science and instruction and recreation of the people" (20 U.S.C. 81). The Zoo administers two permanent facilities. Exhibition, research and educational functions have been centered since 1890 on 163 acres in the Rock Creek Valley of Washington, D.C. Complementary animal conservation, research and breeding functions have been conducted since 1975 on a 3,150-acre site near Front Royal, Virginia.

The National Zoo's Rock Creek Facilities have been undergoing renovations and improvements since FY 1974 through implementation of the Master Plan. The total \$44,530,000 appropriated through FY 1987 for the Master Plan has been spent on 27 new or rebuilt exhibits and support facilities. In November 1986, a revised Master Plan was completed that incorporated changes in exhibit concepts as they have evolved during the past decade. Implementation of the revised Master Plan will place the Park among the world's finest zoos.

For FY 1989, an amount of \$5,305,000 is requested to support construction and improvement projects at the two sites operated by the National Zoological Park. Explanation of the sums of \$4,755,000 sought for Rock Creek and \$550,000 sought for Front Royal follows:

Construction

Aquatic Habitats - Phase I (Amazonia Exhibit-Structure) \$3,200,000 - This exhibit, to be constructed as the first component of the aquatic habitats complex, will utilize major structural components of the existing polar bear exhibit. It will be a greenhouse-enclosed replica of a tropical river flowing through a forest. It is

specifically planned to duplicate a portion of the Amazon river. It will contain plantings of trees and plants to define the forest experience and enclosures for tropical species of birds, mammals, reptiles, amphibians and invertebrates. The exhibit will have an underwater viewing area, forest level viewing path, and a tree top canopy viewing area.

With this funding, the Zoo will modify the existing structural core of the polar bear exhibit. The exhibit area measures approximately 185 feet in length and 90 feet in width at its center and encloses an area of about 13,000 square feet. In addition to the main exhibit area and underground viewing gallery, there will be two smaller exhibit areas (one at each end), and off-exhibit spaces with service and support areas around the outer perimeter. The second phase of the Amazonia Exhibit will provide for the actual interior exhibits and a related funding request is anticipated for FY 1990.

Renovation, Repairs, and Improvements

Rock Creek - \$1,555,000 - An amount of \$1,555,000 is requested to continue the program of renovation, repair and preventive maintenance of existing Zoo facilities. This funding is required to keep the heavily used Zoo in safe condition for the visiting public, for the upkeep and improvement of animal enclosures and staff facilities, and to maintain new buildings in good condition so that in the future the Zoo will not be faced with a large backlog of repairs. In Rock Creek there are over 60 facilities of varying age and 163 acres of land containing over 18 miles of heavily used paths and roadways. The pedestrian paths and vehicle roadways require regular maintenance in order to prevent future, more costly repairs. Funds also will be used to complete emergency repairs to mechanical, electrical, plumbing and other support systems, as well as animal exhibits areas.

Front Royal - \$550,000 - An amount of \$550,000 is sought to continue the program of renovation and repair at the Conservation and Research Center at Front Royal. The Center, which is closed to the general public, is used by the Zoo for breeding endangered wildlife species and for associated conservation and research efforts. The Center includes 89 facilities of various types, containing approximately 236,000 square feet of interior space, two and one-half miles of paved roads, 20 miles of jeep trails and over 30 miles of fences, all of which must be maintained. The funds will be used for preventive maintenance that will reduce potentially more costly future repairs at the 3,150-acre facility.

REPAIR AND RESTORATION OF BUILDINGS

1987 Appropriation.....	\$12,975,000
1988 Appropriation.....	\$19,254,000
1989 Estimate.....	\$20,835,000

The Repair and Restoration of Buildings (R&R) account is used to finance repairs, corrections of conditions to meet life safety and health regulations, and the replacement or renovation of major building equipment or components. (The repairs and renovations at the National Zoological Park are presented separately in this budget submission.)

Smithsonian facilities are comprised of over 5 million square feet of building space located in 14 museum and gallery buildings (including the Quadrangle, which opened in September 1987) in Washington, D.C. and New York City, housing research and collections management activities and a wide range of exhibitions in the fields of science, history, technology and art. In addition, the Institution operates and maintains preservation, storage, aircraft and spacecraft display facilities and the Museum Support Center at Suitland, Maryland; centers for biological research, conservation and education in Panama and on the Chesapeake Bay near Edgewater, Maryland; a center for astrophysics in Cambridge, Massachusetts; and the Whipple Observatory on Mt. Hopkins in Arizona. These facilities range in age from new to 130 years old, and many are listed as Historic Landmarks.

In recent years funding levels for maintenance, repair and preservation of the buildings have not kept pace with the need. There now exists a substantial backlog of essential repair work required to assure continued operation of building equipment and systems, provide long-term preservation of the buildings, or bring the buildings into compliance with life safety and health codes and standards. This backlog is currently estimated at \$216 million throughout Smithsonian buildings, and the backlog has not yet been completely identified in all buildings and facilities.

The present condition of the buildings has been brought about by a number of factors, among them the aging process of building materials, the heavy use of the buildings by the public, the demands placed upon building equipment and systems to maintain 24 hour-a-day constant temperature and humidity requirements to protect the National Collections, and the enactment of new life safety and health codes and regulations. In addition, building systems reach a point where even effective preventive maintenance and repair programs cannot keep the machinery running. Heating, ventilation and air conditioning (HVAC), electrical and plumbing systems must be completely overhauled periodically to replace deteriorated equipment, wires and pipes.

Major increases in funding are required to reduce this backlog and to maintain the buildings for continued use by future generations. Annual funding at a "current services" level in the Repair and Restoration of Buildings program is not sufficient to accommodate the work required. Some of the work is, in fact, more urgent today because inadequate funding in the past prevented the timely repair or replacement of building systems and components.

In previous years, the Smithsonian has presented a list of proposed projects to be initiated with R&R funds. The fact that the Institution has identified a \$216 million backlog of needed repair work suggested a need to distinguish more explicitly between various categories of projects to allow more effective budget planning. Based

upon a review of all proposed projects, it is evident that they can be categorized into three distinct groups: cyclical replacement of major equipment and building systems; otherwise routine necessary repairs; and renovations undertaken because of new or changing programmatic requirements. The FY 1989 budget request for R&R funds acknowledges these distinctions through the separation of repair projects into two sub-accounts in the R&R program, and the establishment of a new sub-account in the Construction account to consolidate projects previously requested in the R&R account that are primarily to alter or modify space in existing buildings to meet programmatic needs. This last category of work will be discussed in the Construction chapter of this budget document.

The first sub-account within the R&R account, called Major Capital Renewal, includes funds for the cyclical replacement of major building systems and equipment and major renovation projects. The magnitude of work involved, the concomitant planning requirements and the expense of these projects are unique from regular and preventive maintenance projects or repairs undertaken when a piece of equipment fails. More than half of the presently identified backlog consists of these major replacement requirements for HVAC and electrical systems at the Natural History, Arts & Industries, American Art and Portrait Gallery and Smithsonian Institution buildings.

The second R&R sub-account is called "Repairs, Restoration and Code Compliance." Funding requested through this sub-account will be dedicated to eliminating the remainder of the backlog of needed repairs. The type of work to be done through this sub-account encompasses six categories of otherwise routine maintenance and repair projects, such as: general repairs; facade, roof and terrace repairs; fire protection and suppression projects; access, safety, and security projects; utility repairs; and advanced planning and inspection for such projects. The request is presented in an aggregate amount with a description of the kinds of work planned in each of the above six categories of work within this sub-account.

In addition, included in this section of the FY 1989 budget request is a description of funding requirements for administrative support for the much expanded level of work associated with the phased elimination of the backlog of deferred repairs. However, resources for administrative support are requested in the Salaries and Expenses account with other operating costs. The composition of this year's R&R budget request follows.

REPAIR AND RESTORATION OF BUILDINGS¹

MAJOR CAPITAL RENEWAL	\$ 3,700,000
REPAIRS, RESTORATION AND CODE COMPLIANCE	
General Repairs	\$ 3,200,000
Facade, Roof and Terrace Repairs	5,190,000
Access, Safety, Security	3,730,000
Fire Detection and Suppression	2,030,000
Utility Systems Repairs	2,280,000
Advanced Planning and Inspection	<u>705,000</u>
Subtotal	17,135,000
TOTAL REQUEST	\$20,835,000

MAJOR CAPITAL RENEWAL

In the life of every building, replacement of building systems or components eventually becomes necessary. Despite the best of care, HVAC systems, for example, reach an age when no reasonable amount of repair can keep the machinery running. Electrical and plumbing systems must be overhauled periodically to replace deteriorated equipment, wires and pipes. A number of the Institution's historic buildings have already reached or are approaching the age where cyclical renewal of building components and systems is required. Initial requirements for the major capital renewal program are described further below. This new sub-account is being established to distinguish this new program of work from other projects. Not only are major renewals of buildings extremely costly, but the planning and scheduling of such work is also very intricate. Moreover, these projects will require a funding commitment spanning several years and cannot jeopardize the continuation of adequate funding for ongoing repair projects which are required to keep facilities in good operational condition and in compliance with life safety and health codes. Without extraordinary attention now to the unique renewal needs of older buildings, their operational integrity is threatened and there is a risk that equipment and systems failure may require the total or partial closing of significant portions of buildings dedicated to exhibitions, collections storage and research activities. The Institution intends to review major capital renewal projects with the appropriate committees of the Congress, according to the wishes expressed by the Appropriation Subcommittees in the FY 1987 budget report.

American History Building (\$2,100,000) - A 1982 study of the HVAC system of the American History Building recommended replacement of the deteriorated heating, ventilation, air conditioning and refrigeration equipment and controls in the now 24-year-old building to assure provision of required environmental conditions in an energy efficient manner. The study also recommended modifications to the building envelope to increase energy efficiency. An amount of \$2.8 million provided in

¹ Following the justification is a chart displaying planned projects for FY 1989 by building.

FY 1985 and FY 1986 (supplemented with \$1.4 million reprogrammed from the HVAC project at the American Art and Portrait Gallery Building) is being used to complete window and roof replacement and facade repairs.

In 1986, a Master Implementation Plan for replacement of the HVAC and related systems was completed. This Plan also incorporated anticipated fire protection and asbestos removal work in such a way that portions of the building could be isolated and all work required in each segment accomplished at the same time. This scheduling of complex but interrelated projects will both result in less disruption to the Museum's activities and save money by allowing an award of a single contract for the entire project.

The first phase of this project is being initiated with funding received in FY 1987 (\$1.2 million), and includes all work required in the east quadrant of the building. Funding received in FY 1988 (\$1.6 million) will be used for Phase II, covering the west central quadrant. The amount of \$2,100,000 requested for FY 1989 will be used for Phase III, the west quadrant, and will include replacement of HVAC equipment (\$1,120,000), installation of sprinkler and smoke detection systems and other fire protection improvements originally outlined in the Fire Protection Master Plan (\$500,000), and removal of asbestos present in mechanical rooms and other areas of the building (\$230,000). Design costs for this segment of work are also included (\$150,000) as is funding to allow relocation of staff and collections displaced by the work (\$100,000).

Natural History Building (\$1,000,000) - Over the past several years a number of separate studies were undertaken that addressed energy conservation, fire protection and suppression, communications, security upgrading, asbestos abatement, and other remedies to building deficiencies, especially in the HVAC system and electrical systems. Once the magnitude of the work required to keep the building in operational condition was realized, a Master Implementation Plan was initiated to plan and schedule the work to limit the major disruption of each area within the building to one period of time and to take advantage of cost savings by grouping tasks together.

Although fire protection improvements have been underway for several years (guided by a Fire Protection Master Plan developed in 1979), and some asbestos removal or containment work has previously been planned, it is the replacement of the HVAC and major electrical equipment that makes this project of major significance and drives the scheduling of the work. The majority of the HVAC equipment has been in operation in excess of 20 years and has deteriorated to such a degree that it must be replaced immediately to avoid system failure. The automatic temperature control system is obsolete and does not operate satisfactorily. Ninety percent of the electrical lighting and power panels in the building has been in service over 20 years and are at or near the end of their useful life, and the main high-voltage switch gear equipment, which serves all the transformers for the Natural History as well as the Freer Gallery, Arts and Industries and Smithsonian Institution Buildings, is approximately 40 years old. These and related electrical equipment components are impossible to repair due to the unavailability of spare parts and must be replaced.

A detailed plan and schedule for the replacement of building systems at the Natural History Building is being developed, with work to be phased over a number of years in order to provide the most cost effective construction sequence while avoiding major disruption of programs or closing of the Museum. The scope of the work includes replacement of the HVAC system with a new centralized system in new penthouses over the east and west wings, and modifications to the building envelope such as roof

insulation, replacement of single-glazed windows with triple glazed windows, installation of air locks or vestibules at entrances and loading docks, centralization of laboratories with new exhaust air systems, improvements to the automatic temperature control system, and connection to a central control and monitoring system. Fire protection work originally planned under the Master Plan will be incorporated, along with removal or encapsulation of asbestos insulation located in the attics and on equipment, duct work and piping throughout the building. A cost estimate for the work is being developed as part of the current planning phase.

Funds appropriated in FY 1986 (\$235,000) were used for the Master Implementation Plan and to evaluate the potential requirements for interim corrective measures to keep the facility operational during the implementation of the project if phased over a long construction period. Amounts of \$100,000 and \$475,000 received in FY 1987 and FY 1988 respectively will be used to complete planning and to begin preparation of design and specifications of the initial phase of the work. For FY 1989, a total of \$1,000,000 is requested to continue design of the initial phases of the major replacement project and to begin planning the relocation of staff and collections affected by the first stages of construction. If needed, some of these funds might also be used for emergency replacement of equipment that has already outlived its useful life.

Arts and Industries Building (\$525,000) - The Arts and Industries Building is one of the finest examples of Victorian architecture in the Nation. Originally designed to house representative artifacts of the Philadelphia Centennial Exposition, the construction of the building was started in April 1879 and completed in March 1881. The underground utility tunnel located within the building is as old as the building itself. Inspection, maintenance, and alterations of these utility systems has been disruptive, difficult and costly, because the trenches are small with minimum access, and much of the piping and electrical circuits within them cannot be reached. Some pipes within the trenches are covered with asbestos insulation. The utility tunnels must be renovated before the HVAC, electrical and other utility systems, now reaching the end of their useful life, can be replaced. Although specific plans for major utility replacement have not yet been developed, it is clear that the present system of tunnels can no longer accommodate change. An amount of \$100,000 was appropriated in FY 1988 to develop a plan and schedule for modification of the tunnel system. The sum of \$525,000 is requested in FY 1989 for design and specifications. It is currently estimated that approximately \$7 million will be required for construction.

American Art and Portrait Gallery Building (\$75,000) - The HVAC system in the American Art and Portrait Gallery Building is now approximately 24 years old and in poor condition and will need to be replaced within the next several years to assure continued operation of the system. At the same time, some improvements will be made to the overall system and the building itself to create environmental conditions required to preserve the collections housed in the building. Particular problems with the existing system include lack of close control of humidity and inability to provide simultaneous heating and cooling required during the transitional seasons--spring and fall--to maintain appropriate temperature. In addition to the replacement of air handling equipment, systems and controls, it is anticipated that the phased plan will include replacement of all windows with double-glazed windows; waterproofing and water detection system for the fourth floor; at a total cost of over \$6 million. For FY 1989, the sum of \$75,000 is requested to study the conditions of the windows in anticipation of more detailed planning for the full project.

REPAIRS, RESTORATION AND CODE COMPLIANCE

Funds requested in this sub-account are for routine repairs to eliminate the remainder of the deferred maintenance backlog. Funding is requested for general repairs; facade, roof and terrace repairs; access, safety and security projects; fire protection and suppression projects; utility repairs; and advanced planning and inspection for such projects. In a change from previous budget presentations, funds are requested in the aggregate for this sub-account rather than by individual project. This will allow the Institution greater flexibility to direct dollars to fund an additional requirement in these areas that could not have been anticipated during the budget or facilities planning cycles. Without this flexibility, it is difficult to respond to changing priorities for repair work, or to deal with situations in which the work required is more or less extensive (or expensive) than originally anticipated. The work planned in each category is described below.

General Repairs (\$3,200,000) - Funds requested in this category support a wide variety of projects that do not lend themselves to discrete categorizations, and provide resources for minor unscheduled, but essential, repairs that cannot be anticipated specifically. For FY 1989, an amount of \$3,200,000 is requested for such projects as waterproofing and installation of a leak detection system in a third floor storage space in the American Art and Portrait Gallery Building; renovations and repairs to the galleries of the Freer Gallery Building to correct electrical and lighting problems and to replace badly deteriorated plaster; installation of a parapet and wall ventilation system at the Hirshhorn Building to correct a moisture problem on gallery walls; repair of a water intrusion problem in a gallery of the Air and Space Building; repair and painting of the gallery windows at the Natural History Building; repair and waterproofing of the pedestrian tunnel between the Smithsonian and Arts and Industries Buildings; painting and repair of the exterior and construction of a handicapped access ramp at the newly acquired Building 28, installation of a rest room for the disabled in Building 22, and covered protection for large equipment at the Silver Hill Facility; building and utility modifications to create an employee's child care center; repairs to sidewalks, parking lots, roads and docks at various locations; general repairs at off-Mall facilities; and emergency repairs required throughout the Smithsonian.

Facade, Roof and Terrace Repairs (\$5,190,000) - Maintaining the integrity of the exteriors of all Smithsonian buildings is critical to prevent major structural and interior damage and deterioration due to age, water intrusion and weathering and to ensure a safe environment for visitors, staff and collections. Energy conservation also demands weather tight exteriors. Work in this category includes a variety of major projects that must be accomplished periodically according to the life cycles of the materials used. For example, roof replacements are needed about every 20 years, facade joints must be recaulked and repointed about every ten years; and window frames and other exterior trim should be repainted every five years. Several Smithsonian buildings require large-scale renovation, and work is under way to assure that in the future adequate protection of the exteriors of these buildings can be provided through a preventive maintenance and repair program.

An amount of \$5,190,000 is requested for facade, roof and terrace repairs for FY 1989. Currently planned projects include roof inspection, repair or replacement at the Cooper-Hewitt Carnegie Mansion, the Natural History Building, Renwick Gallery Building, Hirshhorn Building, Smithsonian Institution Building, and various sites at the Tropical Research Institute and the Silver Hill storage facility. Urgent skylight repairs are needed at the Air and Space Building to correct deficiencies in the

original design, and a permanent solution will be studied and implemented as well. Roof and facade repairs and window replacement are also planned at the Air and Space Building to correct numerous water intrusion problems. The window glass and gaskets in the courtyard of the Hirshhorn Building will also be replaced, as failure of the seal between the panes has caused streaking and etching of the glass and occasionally allowed the panes to come loose. At the Cooper-Hewitt Museum, a basement leak in the Mansion will be corrected and the south facade of the Miller House will be repointed. Projects to restore the stone facade and replace the windows at the Smithsonian Institution Building will continue. The surface of the plaza at the Hirshhorn building must be replaced, as deteriorated paving materials currently present a safety hazard and are allowing water intrusion into building spaces below. A portion of the terrace at the American History Building must be replaced as well to correct a leakage problem in the exhibit galleries beneath the west side. Repair and painting of wooden and metal facades and building elements are also necessary at a variety of locations, including the Tropical Research Institute.

Access, Safety and Security (\$3,730,000) - The Institution continues to place emphasis on correcting facility conditions to improve the security of the National Collections, promote improved environmental conditions for the health and safety of visitors and staff, and provide better access for disabled persons to Smithsonian buildings.

For FY 1989, \$3,730,000 is sought for a number of important projects in these areas. Among the projects planned for correction of hazardous conditions are the continuation of the asbestos abatement program; construction of a hazardous waste disposal facility and correction of a fume hood exhaust problem at the Museum Support Center; construction of an addition to Building 10 at the Silver Hill facility to meet Occupational Safety and Health Administration code requirements for chemical cleaning; construction of a petroleum storage facility at the Tropical Research Institute; and a study of air quality at the Cooper-Hewitt Museum, where airborne fiberglass particles from the lining of the HVAC ducts are cause for concern. Other safety related projects include the repair of courtyard paving, the replacement of the tile floor in the third floor Great Hall, and modifications to the southwest emergency exit at the American Art and Portrait Gallery Building; installation of railings and safety barriers at the South Entrance, and railings on interior stairways in the Natural History Building; and design of a system to provide independent power for emergency lighting and other vital systems in the event of major power outages. Projects to improve access for disabled persons are also planned to meet current code requirements: installation of an elevator and freight lift at the Anacostia Museum; replacement of the Miller House elevator and a study of other access requirements at the Cooper-Hewitt Museum; design for future installation of an elevator for disabled access to the mezzanine level in the "Life at Sea" exhibit hall of the Natural History Building; and rest room modifications to meet disabled access requirements at the American History Building. A number of projects to improve security of the collections, staff and visitors are planned as well, including improvements to the security system at the Freer Gallery Building; and security lighting and parking lot barriers at several Mall buildings.

Fire Detection and Suppression (\$2,030,000) - One of the Institution's major priorities is to provide the highest level of fire protection and safety consistent with today's standards and technology. Fire protection master plans have been developed and are being implemented at the Natural History Building, American History Building, Air and Space Building, American Arts and Portrait Gallery Building, and the Smithsonian Institution Building. Work includes the installation of heat and smoke detection systems; sprinkler and chemical suppression systems; fire doors and walls;

and the improvement of exit capability. For FY 1989, an amount of \$2,030,000 is requested to continue fire protection master plan work in these buildings and to make other fire protection improvements in the Cooper-Hewitt Museum buildings; the Freer Gallery Building; the Renwick Gallery Building; at the Oak Ridge, Massachusetts facility of the Smithsonian Astrophysical Observatory; at the Environmental Research Center; and at the Tropical Research Institute. Lightning protection will also be installed at a number of currently unprotected buildings.

Utility Repairs (\$2,280,000) - Funds in this category will be used to maintain, repair and upgrade the heating, ventilating and air conditioning systems (HVAC) and plumbing, electrical and communications systems in the Institution's facilities. Ongoing renovations, repairs and replacements of deteriorated equipment components are essential for increasing energy efficiency and for providing stable temperature and humidity conditions necessary for the long-term preservation of the National Collections.

Energy conservation remains a high priority at the Smithsonian. The most significant energy savings will be realized by applying substantial resources toward upgrading HVAC systems, replacing obsolete equipment and improving the efficiency of environmental zones. HVAC systems have been modified over the years as the Institution's programs have grown, as the functions of the buildings have changed, and as the environmental needs of the collections have become better understood. An integrated approach to renovations and modifications has now evolved to plan for long-range, systematic HVAC improvements that will meet museum environmental requirements in an energy efficient manner.

Comprehensive HVAC studies and energy audits have been conducted for most of the buildings to assist in planning future improvements. The scope of the HVAC studies included field investigations of age, condition and performance of existing equipment, controls and current operating conditions; reviews of existing drawings, specifications, operating manuals and hygrothermograph records; an analysis of the relationship between the building structures and the HVAC systems; and an assessment of programmatic needs for environmental control. The data gathered by these studies are providing a basis for determining redesign or replacement needs of existing HVAC systems; for development of construction cost estimates; and establishment of priorities for the repair, replacement or modification of such equipment components as air handling units, chillers, condensers, compressors, cooling towers, automatic temperature and humidity controls, pumps, pipes, fans, filters, duct work and related electrical and plumbing systems. At the same time, energy audits are being performed to investigate all factors relating to energy use, such as power-consuming equipment and building conditions (doors, windows, insulation, floors and partitions). After evaluation of costs and potential energy savings and identification of energy conservation opportunities, plans are developed to carry out renovations and improvements. This process has identified a number of major system replacements which will be carried out under the Major Capital Renewal sub-account.

Routine repair, replacement and modification projects will be undertaken using funding of \$2,280,000 requested in FY 1989. Miscellaneous HVAC repairs and modifications are planned for the Air and Space Building, Smithsonian Institution Building, Hirshhorn Building, and the Anacostia Museum. Other repairs include replacement of the steam station equipment and storm drainage system serving the American Art and Portrait Gallery Building; modification of the steam heating system at the Freer Gallery Building; electrical switchgear replacement at the American History Building; and renovations of a rest room in the Arts & Industries Building. A

number of other utility improvement projects are also planned, such as implementation of energy conservation measures and installation of an emergency generator and power surge protection equipment at the Cooper-Hewitt Museum; study and correction of basement ventilation problems at the American History Building; implementation of energy study recommendations at the Renwick Gallery Building; installation of an emergency generator at the Naos site of the Tropical Research Institute; a utility systems study and energy audit of the Smithsonian Institution Building; and replacement of outdated energy and facilities monitoring equipment throughout the Institution's buildings. In addition, planning and design of future phases of the Mall master raceway system will continue.

Advanced Planning and Inspection (\$705,000) - Funds provided in this category will be used for inspection and preliminary planning required in order to develop a long-range facilities repair and renovation program, and to accomplish advanced design of future year projects. A vital component of a comprehensive facilities management program is the ability to plan ahead. Through an active inspection program and a continuing master planning process, the Institution is coming to terms with its present and future repair and restoration requirements. With the amount of \$705,000 requested for FY 1989, the Institution plans to initiate an integrated master plan for all facilities, complete a structural analysis of the Smithsonian Institution Building and an evaluation of the Ancon Building at the Tropical Research Institute, and begin development of a space use and utility plan for the Smithsonian Institution Building. In addition, the Smithsonian will continue to use funding provided to complete the design of smaller, single year projects before receipt of construction appropriations, in order to develop accurate cost estimates and to take advantage of significant cost savings in escalation.

ADMINISTRATIVE COSTS

The amount of 26 workyears and \$1,330,000 is requested for 26 permanent positions required to support the management of the increased Repair and Restoration of Buildings and Minor Construction, Alterations and Modifications programs. In FY 1980, the Restoration and Renovation of Buildings account for the Smithsonian Institution totaled \$5 million. This account has grown in annual funding to over \$19 million in the FY 1988 appropriation. The FY 1989 request represents another major increment of growth--to over \$24 million in funding required for Major Capital Renewal; Repairs, Restoration and Code Compliance; and Alterations and Modifications--(now included in the Construction account). Yet additional staff required to manage the R&R program has not grown as the program has expanded. It is crucial that additional staff be made available to the offices with major responsibilities for management and support of the R&R program, if these much needed resources are to be fully utilized. The requested increases, enumerated below, represent an overhead rate of only 7 percent of the \$19 million increase in the R&R program from the FY 1980 level. Considering the large number of individual projects that makes up the Smithsonian's R&R program and the inherent complexity of construction in museum buildings, where environmental conditions must be maintained 24 hours-a-day and construction must be scheduled around on-going public activities, this rate compares favorably with overhead costs expended by such organizations as the General Services Administration and the U.S. Army Corps of Engineers.

The Office of Design and Construction (ODC) bears the major responsibility for management of the R&R program. In addition to identification and planning of projects, ODC prepares or supervises development of detailed scopes of work, drawings and specifications required to bid the projects, and supervises, inspects, coordinates

all R&R projects. With the expansion of the R&R and minor construction programs to more than \$24 million in FY 1989, the staff of ODC, which has seen little increase since the R&R program totaled \$5 million in FY 1980, will need to be expanded to be able to plan and execute the program effectively. For FY 1989 an amount of 13 workyears and \$691,000 will be used for 13 positions in ODC, including two professional planners to identify and enunciate future facility requirements and develop budgetary needs; two architects and professional engineers to develop or oversee development of project plans and specifications for contracted construction services; two construction engineers to provide full-time on-site construction management; a construction cost estimator to develop detailed government estimates of construction projects; two technicians to support the professional planning and design functions; a computer systems analyst to develop programs and computerized applications for facilities data storage, retrieval and analyses; and three clerical positions for typing and administrative support for all functional areas. Additional office space will be provided, and funding will be used for other support costs such as travel, supplies and materials and training of the added staff. Staff expertise will be heavily supplemented with contractual architectural and engineering services, particularly in highly specialized disciplines not required on a full-time basis and when workload exceeds in-house design capacity.

The Office of Procurement and Property Management also has extensive responsibilities related to the R&R program. At various stages in the life of most projects, contracts must be bid, negotiated, awarded and administered. The number of contracts is a more accurate determining factor in developing estimates for staffing requirements to support the R&R program than the amount of funding available. Although there are a number of very large projects included in the expanded R&R program proposed for FY 1989, the majority of the requested funding will be used for the same kind of small to moderate sized projects as those that make up the present program. The number of projects and, therefore, the number of contracts required, in the FY 1989 request, is double the number planned in FY 1988. An amount of \$425,000 and 8 workyears is, therefore, requested for 8 positions in the Office of Procurement and Property Management to support the R&R program. These positions include two senior architectural and engineering contract negotiation and administration specialists, two senior construction contract negotiation and administration specialists, a computer systems specialist to assist in the development of necessary support systems, and three clerical positions for typing and record keeping support. Funding will also be used to provide appropriate office space for the additional staff. An increase of 2 workyears and \$126,000, justified in the Administration line-item for OPPM, is related to growth in the Institution's operations as opposed to this increase, which is related to the expanded facilities program.

In addition, staff resources are required in several other administrative offices to assure the essential level of support for the R&R program. For the Office of Environmental Management and Safety, 2 workyears and \$106,000 are requested for a fire protection engineer and a safety/environmental specialist to review project designs and specifications to assure all applicable life safety and health codes are met and to assure code compliance on construction sites. The sum of \$46,000 and 1 workyear is sought for the Office of Audits and Investigations for an auditor to assist in the required review of all contracts over \$100,000 before award. An accounting technician and \$20,000 and 1 workyear is requested for the Office of Accounting and Financial Services to assist in the processing of the expected volume of requisitions related to the R&R projects, and a personnel specialist and \$42,000 and 1 workyear is required for the Office of Personnel Administration to provide personnel services for all the staff proposed for the R&R program.

REPAIR AND RESTORATION OF BUILDINGS

Detail of FY 1989 Request by Building

<u>FACILITY, ACCOUNT AND PROJECT TITLE</u>	<u>SUBCATEGORY</u>	<u>ESTIMATED COST</u>
<u>American History Building</u>		
MAJOR CAPITAL RENEWAL		
HVAC Replacement		1,120,000
Fire Protection		500,000
Asbestos Removal		230,000
Design & Relocation Costs		<u>250,000</u>
SUBTOTAL		2,100,000
REPAIR, RESTORATION AND CODE COMPLIANCE		
Terrace Repair	Facade	500,000
Modifications for Disabled Access	Access	155,000
Switchgear Replacement & Lights Control Study	Utility	425,000
Basement Ventilation Study & Implementation	Utility	<u>200,000</u>
SUBTOTAL		1,280,000
TOTAL FOR FACILITY		3,380,000
<u>Natural History Building</u>		
MAJOR CAPITAL RENEWAL		
HVAC & Electrical Equipment Replacement, Design		1,000,000
REPAIR, RESTORATION AND CODE COMPLIANCE		
Gallery Windows Painting & Scraping	General	120,000
Roof Repairs	Facade	100,000
Fire Protection Master Plan Implementation	Fire	400,000
North & South Entrance Modifications	Access	350,000
Interior Handrails	Access	210,000
Hall 16 Disabled Access, Design	Access	<u>10,000</u>
SUBTOTAL		1,190,000
TOTAL FOR FACILITY		2,190,000
<u>Smithsonian Institution Building</u>		
REPAIR, RESTORATION AND CODE COMPLIANCE		
Tunnel Repair & Waterproofing	General	100,000
Facade Restoration	Facade	50,000
Window Replacement	Facade	750,000
Smoke Detection/Sprinklers/Fire Zones	Fire	250,000
Utility Systems Study/Energy Audit	Utility	70,000
Miscellaneous HVAC/Mechanical Projects	Utility	100,000
Structural Inspection, Preplanning Study	AdvPlan	100,000
Basement Space Use Master Plan Study	AdvPlan	<u>65,000</u>
TOTAL FOR FACILITY		1,485,000

Arts and Industries Building

MAJOR CAPITAL RENEWAL

Utility Tunnel Repair & Replacement, Design 525,000

REPAIR, RESTORATION AND CODE COMPLIANCE

SE Pavilion Restroom Renovation Utility 100,000

TOTAL FOR FACILITY 625,000

American Arts and Portrait Gallery Building

MAJOR CAPITAL RENEWAL

Window Repair & Replacement, Design 75,000

REPAIR, RESTORATION AND CODE COMPLIANCE

Waterproofing & Detection General 350,000

Fire Protection Improvements Fire 200,000

Courtyard Paving Repairs Access 25,000

Southwest Exit Modifications Access 60,000

Repair Tile Floor, Great Hall Access 120,000

Southwest Corner Storm Drain Modifications Utility 50,000

Replace General Post Office Steam Station Utility 35,000

SUBTOTAL 840,000

TOTAL FOR FACILITY 915,000

Air and Space Building

REPAIR, RESTORATION AND CODE COMPLIANCE

Leak Repair in Gallery 105 General 50,000

Roof Repairs Facade 100,000

Facade Repairs/Water Intrusion Facade 100,000

Skylight Interim Repair & Replacement Facade 350,000

Window Replacement Facade 300,000

Fire Protection Master Plan Implementation Fire 500,000

Energy Study Implementation Utility 50,000

Miscellaneous HVAC Projects Utility 100,000

TOTAL FOR FACILITY 1,550,000

Renwick Gallery Building

REPAIR, RESTORATION AND CODE COMPLIANCE

Roof Repairs Facade 80,000

Fire Protection Improvements Fire 100,000

Energy Study Implementation Utility 200,000

TOTAL FOR FACILITY 380,000

Freer Gallery Building

REPAIR, RESTORATION AND CODE COMPLIANCE

Gallery Repair & Renovation General 955,000

Fire Alarm Improvements, Gallery & Attics Fire 100,000

Security System Access 150,000

Modify Steam Heating System Utility 150,000

TOTAL FOR FACILITY 1,355,000

Silver Hill Facility

REPAIR, RESTORATION AND CODE COMPLIANCE

Restroom for Disabled, Building 22 (NASM)	General	30,000
Covered Storage for Rolling Equipment (NASM)	General	165,000
Painting & Repair of Building 28 (NMAH)	General	40,000
Roof & Structural Repairs, All Buildings	Facade	50,000
Addition for Chemical Cleaning, Bldg. 10 (NASM)	Access	<u>200,000</u>

TOTAL FOR FACILITY 485,000

Museum Support Center

REPAIR, RESTORATION AND CODE COMPLIANCE

Hazardous Waste Storage	Access	70,000
Fume Hood Modifications	Access	<u>100,000</u>

TOTAL FOR FACILITY 170,000

Smithsonian Environmental Research Center

REPAIR, RESTORATION AND CODE COMPLIANCE

General Repairs	General	30,000
Dock Structural Analysis & Repair	General	25,000
Road Repairs & Improvements	General	50,000
Miscellaneous Fire Protection Improvements	Fire	<u>20,000</u>

TOTAL FOR FACILITY 125,000

Hirshhorn Museum and Sculpture Garden

REPAIR, RESTORATION AND CODE COMPLIANCE

Parapet & Wall Ventilation	General	50,000
Court Glass & Gaskets	Facade	235,000
Plaza Resurfacing	Facade	1,800,000
Roof Inspection/Survey	Facade	10,000
Miscellaneous HVAC Projects	Utility	<u>100,000</u>

TOTAL FOR FACILITY 2,195,000

Anacostia Museum

REPAIR, RESTORATION AND CODE COMPLIANCE

General Repairs	General	20,000
Install Elevator & Freight Lift	Access	135,000
Miscellaneous HVAC Modifications	Utility	<u>25,000</u>

TOTAL FOR FACILITY 180,000

Cooper-Hewitt Museum

REPAIR, RESTORATION AND CODE COMPLIANCE

General Repairs	General	50,000
Sidewalk Repair/Replacement	General	85,000
Mansion Roof: Immediate Repairs & Replacement	Facade	275,000
Receiving Room Leakage, Mansion Basement	Facade	100,000
South Facade Stone Repointing, Miller House	Facade	35,000
Miscellaneous Fire Protection Improvements	Fire	185,000
Miller House Elevator Replacement	Access	180,000

Fiberglass/Air Quality Study	Access	20,000
Handicapped Access	Access	20,000
Energy Study Implementation	Utility	50,000
Emergency Generator/Surge Protection	Utility	<u>150,000</u>

TOTAL FOR FACILITY 1,150,000

Smithsonian Tropical Research Institute

REPAIR, RESTORATION AND CODE COMPLIANCE

General Repairs	General	50,000
Painting of Structures	Facade	100,000
Roof Repairs - Various Sites	Facade	55,000
Fire Protection - Various Sites	Fire	100,000
Petroleum Storage Facility	Access	25,000
Emergency Generator & Building - Naos	Utility	175,000
Ancon Building Evaluation	AdvPlan	<u>15,000</u>

TOTAL FOR FACILITY 520,000

Smithsonian Astrophysical Observatory

REPAIR, RESTORATION AND CODE COMPLIANCE

Road Repairs & Improvements	General	400,000
General Repairs - Whipple Observatory	General	50,000
General Repairs - Oak Ridge & Cambridge	General	30,000
Fire Detection System - Oak Ridge	Fire	<u>15,000</u>

TOTAL FOR FACILITY 495,000

Miscellaneous Locations

REPAIR, RESTORATION AND CODE COMPLIANCE

Emergency Repairs Throughout SI	General	200,000
Sidewalk Repairs & Parking Lot Improvements	General	50,000
Child Care Center	General	300,000
General Facade Renovations	Facade	200,000
Lightning Protection - Various Sites	Fire	160,000
Asbestos Abatement	Access	1,000,000
Security Lighting - Mall Buildings	Access	450,000
Emergency Power Study/Design	Access	150,000
Security Barriers	Access	300,000
Mall Master Raceway	Utility	100,000
Energy/Facilities Monitoring Upgrade	Utility	200,000
Advanced Planning & Design Funds	AdvPlan	375,000
Combined Master Plan for SI Facilities	AdvPlan	<u>150,000</u>

TOTAL MISCELLANEOUS 3,635,000

TOTAL REQUEST 20,835,000

CONSTRUCTION

1987 Appropriation.....	\$6,095,000
1988 Appropriation.....	\$1,315,000
1989 Estimate.....	\$10,150,000

The FY 1989 request for funding in the Construction account represents the Institution's long range goals to develop adequate facilities to support its far reaching programs in research, collections management, exhibitions, education and public service. While recognizing that the backlog of deferred maintenance and repair to existing buildings is a cause for grave concern, the Smithsonian is also responsible for providing appropriate space in which its varied programs can function effectively. Program vitality depends on the ability to keep pace with requirements for new or modified space for public activities such as exhibitions, performances and classes, and for behind the scenes work such as collection storage, management and research. A well planned and consistently funded capital improvement program is essential to meet these requirements and to accommodate future program goals. These two competing needs -- the need to assure the operation and preservation of existing facilities and the need to sustain programmatic activities -- present the Institution with a challenge that can only be met through careful balancing of the two requirements.

The Institution proposes to assist this process by distinguishing more clearly between these two kinds of facilities related requirements. Beginning with this budget presentation, the Repairs and Restoration of Buildings (R & R) account will include only those projects required to repair and preserve its existing facilities and to make modifications necessary to assure compliance with life safety and health codes. All programmatically driven projects will be requested in the Construction account.

Within the Construction account, an additional distinction will be made. Projects under \$1 million in estimated cost, which were previously requested in the "Other Projects" category of the R & R account, will be included in a new category titled "Minor Construction, Alterations and Modifications." Projects in this category will include minor alterations to existing space to accommodate changes in programmatic activities, or to prepare for new initiatives; and small new buildings needed to replace or expand space available for program use. Major construction projects will continue to be requested as separate items, as in the past. This differentiation between minor and major projects is important to define not only initial construction cost, but also the magnitude of the scope of the change or addition to Smithsonian facilities, and potential impact on operating costs and requirements. Also, although projects in the Construction account have traditionally required Congressional authorization, projects in the Minor Construction, Alterations and Modifications category will, by comparison, be limited in scope or cost and will not require formal authorization.

The Institution also proposes another new category in the Construction account, Construction Planning, to provide resources for the assembly of requirements and the development of plans and estimates for projects in both construction categories. This funding will allow the development of the level of planning detail required to make wise choices between competing priorities, as well as to allow more accurate construction and operating cost estimates to be compiled prior to requests for funding.

It is expected that the proposed distinctions between kinds of facilities requirements reflected in the restructuring of the R & R and Construction accounts will assist the decision making process and provide a basis for clearer enunciation of needs.

For FY 1989, the amount of \$3,200,000 is sought to complete construction of the base camp at the Fred L. Whipple Observatory in Arizona; \$2,750,000 is requested to continue development of research facilities at the Tropical Research Institute in Panama; \$3,200,000 is requested for 14 projects in the Minor Construction, Alterations and Modifications category; and \$1,000,000 is required for identification and planning for future facility development requirements.

FRED L. WHIPPLE OBSERVATORY

In 1986, the Smithsonian Institution received authorization to construct a base camp and access road for the Fred Lawrence Whipple Observatory (FLWO) in Arizona (Public Law 99-423). The amount of \$1,315,000 appropriated in FY 1988 will be used for design and construction of the access road (minus the final paving), design of the base camp, and excavation, grading and other site improvements necessary before construction of the base camp can begin. For FY 1989, the sum of \$3,200,000 is requested to complete construction of the base camp.

The Fred Lawrence Whipple Observatory, located on Mount Hopkins in southern Arizona, is the largest field installation of the Smithsonian Astrophysical Observatory. Since its official opening in 1968, the Observatory has been used as the site for observations requiring extremely dark skies, dry climate, and good "optical seeing." Mount Hopkins is the second highest peak in the Santa Rita Range of the Coronado National Forest. The Smithsonian's Observatory covers 4,744 acres, including the 8,550-foot summit.

The summit of Mount Hopkins is the site of the Multiple Mirror Telescope (MMT), a joint facility of the Smithsonian Institution and the University of Arizona. The MMT is the third largest telescope in the world in collecting area and is used for research in the optical and infrared regions of the spectrum. The first of its kind, the MMT combines six 1.8-meter telescope mirrors in a common support structure to produce the light-gathering capability of a conventional 4.5 meter telescope.

Instruments of the Fred Lawrence Whipple Observatory are located on a half-mile-long ridge at the 7,600-foot elevation. These instruments include a 10-meter optical reflector for observations of extremely energetic gamma ray events and 1.5-meter and 61-centimeter reflecting telescopes for optical and infrared observations of distant stars and galaxies. The latter telescope is now being replaced by one with a 1.2-meter diameter.

The administrative and support facilities of the Observatory, which serve all mountaintop activities, are currently located at Amado, Arizona, in an office and maintenance complex just east of Interstate 19, but west of the Santa Cruz River, and 18 miles from the scientific operations on Mount Hopkins. This base camp is the operational and logistical headquarters for anyone working at or visiting the mountain. Its site consists of two adjacent leased parcels of land totaling approximately 4.25 acres; its facilities include a one-level school building and a one-level residence which have been converted for office use. There are also vehicle service, repair, and storage sheds on the site.

A number of years ago, the owners of the site indicated a desire to sell the property. The Institution considered purchasing the site, and received authorization in 1983 (Public Law 98-73) for an appropriation of \$150,000 for the purchase. It has since become clear, however, that the site is no longer suitable as a base camp for operations on Mt. Hopkins. In October of 1983, flooding of the normally dry Santa Cruz River washed out the bridge between the base camp and the mountain facilities. Although a temporary river crossing has been maintained at the site of the former bridge since that time, Santa Cruz County has indicated that it will not continue to maintain a bridge at that location, in part because another bridge has recently been constructed by neighboring Pima County three miles north of Amado at Canoa Road.

A master plan, to be completed in March of 1988, was undertaken to assess a number of alternative new sites for the base camp and to develop detailed construction cost estimates and survey information on the first choice site. The site selected by the Institution is on land under the control of the United States Forest Service. It is closer to the mountain than the existing base camp location, is east of the Santa Cruz River, and can be connected to the new bridge at Canoa Road by construction of a four mile section of road. An environmental impact assessment study has been completed and negotiations are under way with the United States Forest Service for acquisition of the site and with the State of Arizona for the right of way for the new road.

Funds were appropriated in FY 1988 to begin construction of the new base camp. The amount of \$1,315,000 was provided for design of the base camp, design and construction of the access road (without the final paving, which should be done after construction of the base camp is complete), and pre-construction site improvements. An amount of \$3,200,000 is requested in FY 1989 for construction of the base camp buildings totaling 16,400 square feet, along with completion of site improvements and paving of the road. A breakdown of estimated costs and a description of the facilities planned follows.

	<u>FY 1988</u> <u>Appropriation</u>	<u>FY 1989</u> <u>Estimate</u>
Administration Building and Visitor Center		\$ 730,000
Vehicle Maintenance Shop		520,000
Warehouse		350,000
Site Improvements	\$ 510,000	475,000
Access Road	625,000	625,000
Escalation		350,000
Design and Construction Management	<u>180,000</u>	<u>150,000</u>
Total	\$1,315,000	\$3,200,000

The operation of a large astronomical observatory such as Whipple requires computation and drafting facilities, public display areas, tool shops, vehicle maintenance and storage areas, space for the receipt and shipment of equipment and supplies, and administrative offices, all with access to major transportation routes in order to coordinate activities in several locations. The Observatory is, in effect a small scientific mountaintop town which must be supported from the base camp. In addition, the increased public interest in astronomy nationwide, combined with interest in the unusual Multiple Mirror Telescope, has created a growing demand for

access to the Observatory and a resultant need for expanded facilities to serve the public. The demand for access to the mountain is anticipated to increase sharply since the MMT has been chosen as the prototype for the construction of a larger new generation telescope called the "New Technology Telescope," and by efforts to reconfigure the MMT to a single mirror, 6.5-meter instrument. (See Major Scientific Instrumentation section in the Salaries and Expenses section of this budget.)

The proposed new base camp will provide space for all of these functions. The amount of \$730,000 is requested for construction of the Administration Building and Visitor Center, which will provide 5,900 square feet of space for purchasing, fiscal, engineering and secretarial support, and for displays and briefings about the activities being conducted at the Observatory. The Vehicle Maintenance Shop, for which an amount of \$520,000 is requested, will provide 4,500 square feet of service and storage space to accommodate more than 60 vehicles, primarily buses and heavy machinery used for road maintenance. Enclosed motor maintenance shops are required due to extreme weather fluctuations in the desert environment, and space is needed for spare parts storage. The sum of \$350,000 is needed for a warehouse facility of 6,000 square feet for secure storage of goods and equipment going to and from the Observatory. An amount of \$475,000 will be required to complete site improvements, to include utilities, pedestrian walkways, driveways, parking areas and motor pool areas. The sum of \$510,000 appropriated in FY 1988 will be used for earth movement, drainage work and other necessary pre-construction site improvements.

In addition, an amount of \$625,000 is requested for paving of an all-weather access road from the permanent bridge crossing at Canoa (near Interstate 19) to the proposed base camp. At present, no reliable access exists for the transportation of staff, visitors, and equipment from the present leased base camp to the Observatory on Mt. Hopkins. A temporary bridge, erected following a severe flood of the Santa Cruz River in 1983, currently provides access to the Observatory. Santa Cruz County has recently decided not to erect a permanent bridge (capable of resisting flooding), thereby making it unreliable as a means of access to the Observatory in the future.

Faced with the above difficulties and the desire to be closer to the summit, the decision was made by the Institution to situate the new camp on the opposite side of the Santa Cruz River and to access this facility by means of a new bridge crossing at Canoa Road in Pima County, three miles north of Amado. The use of this new crossing, with convenient access to Interstate 19, will require a new four-mile paved road which will intersect with the existing Amado Road approximately three miles west of the proposed base camp. From this juncture to the new base camp, the existing three-mile section of the road will require upgrading with particular attention to widening and paving. This seven-mile stretch of all-weather road will allow much improved, permanent access from the Interstate to the base camp. At the base camp, the road will connect to a Forest Service road that continues to the summit of Mt. Hopkins. The amount of \$625,000 appropriated in FY 1988 will be used for design and construction of the access road (including the purchase of necessary rights of way from the State of Arizona). The \$625,000 requested for FY 1989 will be used for final paving of the road surface upon completion of construction. Title to the completed paved road will be vested in Pima and Santa Cruz Counties for future maintenance.

A further amount of \$350,000 will be required to cover anticipated escalation in project costs and \$150,000 will be needed for construction management of the project.

SMITHSONIAN TROPICAL RESEARCH INSTITUTE

In 1986, Congressional authorization was received under Public Law 99-423 for planning and construction of improved housing and additional research facilities at various sites of the Smithsonian Tropical Research Institute (STRI) in Panama, as part of the Institution's coordinated effort to improve science facilities. For FY 1989 an amount of \$2,750,000 is requested to continue development of STRI facilities with construction of a laboratory and growing facilities on Barro Colorado Island.

The Smithsonian Tropical Research Institute, located in the Republic of Panama, is the principal United States center for research in tropical biology. Each year hundreds of national and international researchers join the permanent STRI staff in undertaking fundamental studies on the tropics. Increasingly, scientists and policy makers have recognized the need to understand how tropical ecosystems function, to predict more accurately environmental changes in temperate zones and guide development programs that affect tropical environments.

The Smithsonian has identified a need to replace and improve obsolete, substandard facilities now in use at the Smithsonian Tropical Research Institute, as well as to provide additional facilities to support the current research program. The Smithsonian plans a phased construction program, to be completed in the next several years, according to a master plan which was completed in March 1986. In FY 1987, an amount of \$2,780,000 was appropriated toward the construction of a terrestrial laboratory and conference center on the Tivoli site with the balance of \$4,000,000 coming from a gift. Resources sought in FY 1989 for construction of a laboratory and research facility on Barro Colorado Island will continue development at that site as outlined in the master plan.

The Barro Colorado Nature Monument encompasses 12,000 acres of tropical forest surrounding the central portion of the Panama Canal, where over 60 years of previous biological research provides foundation information for current research without parallel anywhere in the tropics. Under the Panama Canal treaties, STRI was assigned custodianship of this area on behalf of the United States and the Republic of Panama. Barro Colorado Island (BCI), at the center of the Nature Monument, is one of the most intensely studied tropical sites in the world, attracting scientists from all parts of the globe. In addition to the field research sites immediately accessible by footpath from the existing development on BCI, the Island serves as the logistics base to field sites accessible by boat on the peninsulas surrounding the island. The Island is also the logistic and communication center of the game warden contingent that provides 24-hour patrol of the large Nature Monument area. The 3,707 acre Island site is located 30 miles from Panama City in Gatun Lake on the Atlantic side of the continental divide. The Island site is accessible only by boat from the mainland.

The research on BCI entails both field observational studies and, increasingly, the use of modern laboratory equipment and computers. The existing wood frame laboratory possesses few of the modern features necessary to support sophisticated research, and has become deteriorated and costly to maintain due to its susceptibility to the constant humidity and termite infestations. The amount of \$2,750,000 requested for FY 1989 would be used to design and construct replacement laboratory facilities on the Island. A detailed breakdown of estimated costs and a description of the facilities plan follows.

	FY 1989 <u>Estimate</u>
Construction	\$2,050,000
Escalation	350,000
Design and Construction Management	250,000
Fixed Equipment	<u>100,000</u>
Total Project Cost	\$2,750,000

The amount of \$2,050,000 is required to construct a new laboratory facility of approximately 12,200 square feet along the shoreline site of the Island, near the dining and staff accommodations now being built with funds from the Repair and Restoration of Buildings account. The building will contain communal laboratory facilities for use by both resident and visiting scientists, including an entomology laboratory, instrument laboratory, chemical laboratory, balance room, computer room, darkroom, and cold storage room, as well as laboratories and offices for scientists. In conjunction with the new building, a vivarium, an insectary, and a growing house, a total of about 5,300 square feet of space, will be constructed at the existing cleared site up the hill from the shoreline. These facilities are essential to support studies of animal, insect and plant specimens. No adequate vivarium currently exists. The insectary is, at best, only a makeshift temporary structure sitting precariously atop an old water tank, and the existing growing house contains insufficient space to meet total needs of the plant biologists. An amount of \$350,000 will be required to cover anticipated escalation in project costs and \$250,000 will be needed for design and construction management of the project. In addition, an amount of \$100,000 is required for fixed equipment for the laboratory and growing space.

MINOR CONSTRUCTION, ALTERATIONS AND MODIFICATIONS

Projects in this category include minor new construction (under \$1,000,000 in estimated cost), and alterations and modifications to existing buildings required to meet programmatic objectives in the areas of research, collections management and exhibitions. For FY 1989, a total of \$3,200,000 is requested for the projects described below.

American History Building (\$670,000) - For FY 1989, funds are requested for two projects in the American History Building: the continuation of the project to install mezzanines in exhibit halls and renovation of the conservation laboratory.

The long-range exhibit reorganization plan for the National Museum of American History calls for construction of a mezzanine system in various galleries on the first through third floors of the building. The mezzanines will create space for study galleries in key exhibits, which will permit greater individual interaction by the public with museum artifacts not normally on exhibit because of lack of space. An amount of \$103,000 received in FY 1987 is being used to begin design, fabrication and construction of the basic steel and concrete galleries, necessary stairs, handicapped lifts and railings which will be incorporated into specific exhibit areas currently being designed by the Museum. The first exhibit to include the gallery concept is the exhibit planned to celebrate the Bicentennial of the Constitution, which opened in the fall of 1987 on the east side of the third floor. The sum of \$300,000 anticipated in FY 1988 will be used for installation of mezzanines to be incorporated into the north sector of the Dibner Library and the southwest sector of the Medical Sciences Hall on the first floor. The amount of \$370,000 is requested for FY 1989 to complete the Research Center in the present Dibner Library.

The sum of \$300,000 is requested in FY 1989 for renovation of the conservation laboratory. Currently located in two separate locations in the basement of the building, much of the space was not constructed to serve as a laboratory. In addition to reorganizing the space to increase efficiency, utility improvements will be made, such as installation of fume hoods and upgrading the water supply and electrical service.

Natural History Building (\$350,000) - A total of \$350,000 is requested in FY 1989 for various projects in the Natural History Building, including installation of rest rooms at the West Loading Dock, and modifications to office space.

An amount of \$230,000 is requested to renovate the space vacated by the recent relocation of the Automated Data Processing Center to provide additional space for adjacent staff offices, and to provide much needed conference space, rest rooms and kitchen facilities. The consolidation of the museum's central administrative functions in this area will increase efficiency of current operations of the Museum.

The sum of \$120,000 is requested in FY 1989 for construction of new rest room facilities near the West Loading Dock of the Natural History Building. Staff working in the West Basement and Court areas of the building, and contractors using the Loading Dock currently do not have adequate access to such facilities.

Arts and Industries Building (\$660,000) - In recent years, relocation of staff prompted by the exterior work on the Arts and Industries building and the move of some staff to the new Quadrangle building, the Smithsonian has had an opportunity to begin planning consolidation of various central administrative and program functions to permanent locations within the A&I building. The exterior renovation will be complete in FY 1988, and funding is required to renovate spaces to accommodate relocation of functions in permanent spaces to permit greater efficiency of activities. An amount of \$660,000 is requested in FY 1989 to renovate approximately 11,000 square feet of office space.

American Art and Portrait Gallery Building (\$50,000) - An amount of \$50,000 is requested in FY 1989 to improve the lighting to highlight the South Portico of the Building. The "F" Street entrance is used for evening events and the lighting needs to be improved for both safety and aesthetic purposes. The Pennsylvania Avenue Development Corporation is involved in a study to determine the best approach to lighting the South Portico.

Air and Space Building (\$520,000) - The sum of \$520,000 is sought in FY 1989 for renovation of the space currently occupied by the cafeteria at the Air and Space Building. Like many other Smithsonian organizations, the programs of the National Air and Space Museum have expanded in the past ten years. In late 1988 a new cafeteria complex will open on the East Terrace of the building, and the Museum proposes to use the third floor space currently occupied by the cafeteria to expand staff offices. A study is currently under way to determine the most effective use of the available space, approximately 12,000 square feet. An amount of \$520,000 is requested for FY 1989 for design and renovation of the space to accommodate the new functions.

Tropical Research Institute (\$415,000) - Funding in FY 1989 is requested for several projects at the Smithsonian Tropical Research Institute in Panama, including demolition work at Barro Colorado Island, seawater system improvements at Naos, and construction of a dock at Gamboa.

With funding provided in FY 1987 and FY 1988, new facilities at Barro Colorado Island are being constructed in a location more accessible to the waterfront. A number of these new buildings are replacing deteriorating and obsolete facilities, which must now be removed. For FY 1989, \$65,000 is requested for the demolition of the generator shed, kitchen and dining facilities, Workers House, Barbour House, Paper House, Elevated Water Tank, Animal House, Kodak House, the Laboratory and the Insectary.

The sum of \$50,000 is requested for improvements to the seawater filter system, used for research at the Naos site. The current system cannot deliver sufficient volume within reasonable time periods to meet the needs of scientists. Modifications to the system will include larger pumps and additional filters for the existing system.

Gamboa is located on the Panama Canal about 15 miles northwest of Panama City. During the past year, this important research station has used docking facilities owned by the Panama Canal Dredging Commission to transport personnel and supplies to Barro Colorado Island. The docking arrangement is only temporary and the Commission has requested that the Tropical Research Institute provide its own facilities as soon as possible. As Gamboa is now the only "jumping off" point to Barro Colorado, it is critical that docking facilities be constructed to maintain regular and dependable transportation to the Island. The proposed dock will be a secure shoreline facility where large and small boats can be berthed and fueled, and cars can be securely parked while staff is on the Island. An amount of \$300,000 is requested in FY 1989 for construction of the docking facility.

Smithsonian Astrophysical Observatory (\$120,000) - Funding is requested for a communications system for the new Base Camp at the Fred L. Whipple Observatory in Arizona. Construction of a new Base Camp will be initiated with funds received in FY 1988. In order to provide voice and data communications at the new Base Camp located in a remote area of Arizona, \$120,000 is requested in FY 1989. The communications system was not included in the scope of work of the Base Camp, as it was previously funded under the R&R program, but the final phase was deferred in FY 1987 to accelerate the PCB (polychlorinated biphenyls) removal program.

Smithsonian Archives (\$175,000) - The Smithsonian Institution Archives is presently experiencing a storage problem. With an annual growth of approximately 800 cubic feet, the Archives is rapidly running out of space. The Archives proposes to modify a building presently available at the Conservation and Research Center at Front Royal to serve as a storage area for seldom used materials. An amount of \$175,000 is requested in FY 1989 for installation of an environmental room, or "Bally" box in the interior of the building. Construction of this space will free much needed room on the Mall to accommodate growth for frequently used materials.

Photographic Services (\$75,000) - Funds are sought in FY 1989 for expansion of space available to the Office of Photographic Services. The Photo Lab at the Natural History Building was constructed in late 1964. In the intervening years the mission and volume of work has changed and grown. Improvements are needed to the lab to make the space more efficient, and to provide a new light trap door for the dark room. The sum of \$75,000 is requested to make the necessary modifications.

Smithsonian Institution Libraries (\$165,000) - Funding is requested for a project to increase the efficiency of the Smithsonian Institution Libraries, a resource vital to the research programs of the Institution. The present rare book storage area in the

Arts and Industries Building is completely filled and awkward to service. A new Rare Book Library is proposed at the Natural History Building, and an amount of \$165,000 is requested in FY 1989 for construction of the new facility. The new area will include secure stack space with adequate shelving for large volumes, map and odd-size materials, reading and staff work areas, and an exhibit and special events area. This new facility will provide protection for rare books valued at several million dollars, while making them more accessible to scholars.

CONSTRUCTION PLANNING

An essential part of an effective facilities development program is the ability to assess major requirements and make long-range plans in appropriate detail. These actions are required so that all issues affecting the projects, including program needs, spacial concepts and preliminary cost estimates may be identified and addressed before Smithsonian management decisions are made and approval is sought from Congressional committees and applicable review commissions. The Institution's current construction planning process results in requests for full funding of major construction projects (estimated cost above \$1 million) often without the full benefit of this detailed level of planning. This situation can result in approximations of project requirements, including physical requirements such as space or configuration, construction or operational costs, and environmental or logistic considerations. Also, the lack of resources with which to identify and assess fully all potential physical plant requirements has occasionally resulted in a piecemeal approach to capital improvement planning, and certain urgent requirements have not been integrated into Institutional plans in a timely fashion.

The Smithsonian proposes to correct this situation with requests in FY 1989 and succeeding years to develop a comprehensive long-range capital improvement program and to provide more definitive planning of future year construction projects prior to budget and authorization requests. A recent rough estimate of currently identified facilities expansion or improvement requirements total in excess of \$900,000,000. Specific projects include completion of master plan development at the Tropical Research Institute in Panama, renovation of the General Post Office Building, development of an extension for the Air and Space Museum at a nearby airport, construction of administrative and support facilities to replace leased buildings at 1111 North Capitol Street and L'Enfant Plaza, and expansions of the Cooper-Hewitt and Hirshhorn museums. In addition, the general issue of development of extensive off-Mall facilities for collections storage must be addressed in the near future in order to find solutions for already overcrowded conditions in nearly all Smithsonian museums. Annual funding in the range of \$1 to \$1.5 million will provide feasibility studies, planning and conceptual designs upon which to base precise scopes of work and cost estimates for construction, establish operating and logistical support requirements, and make required environmental impact assessments for the most urgent of the construction and modification projects under consideration by the Smithsonian management.

Projects for which the \$1 million requested for FY 1989 will be used include completion of more detailed planning required before the design of the proposed renovation of the General Post Office Building can be initiated; for planning and feasibility studies for a complex for the storage and exhibition of, and research on air and space craft and technology to be located at an airport convenient to the Washington Metropolitan area; and to begin comprehensive long-range planning for expansion of collection storage capacity for a number of Smithsonian museums.

SMITHSONIAN INSTITUTION

Annual Visitation
FY 1983 - FY 1987

<u>MALL</u>	<u>FY 1983</u>	<u>FY 1984</u>	<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>
SI Building	950,426	966,191	1,046,151	1,035,653	1,160,655
Arts & Industries Building	1,043,224	1,046,480	1,048,089	1,047,397	1,228,911
National Museum of Natural History	5,650,406	6,336,796	5,691,681	5,962,073	7,886,520
National Air and Space Museum	9,837,651	15,123,914	9,160,371	7,752,544	7,750,323
Freer Gallery of Art	269,980	373,208	291,376	308,236	303,613
Sackler Gallery /1	-	-	-	-	7,095
National Museum of African Art /1	-	-	-	-	14,555
Ripley Center /1	-	-	-	-	4,674
National Museum of American History	5,049,038	5,392,718	4,858,483	5,143,334	5,626,565
Hirshhorn Museum and Sculpture Garden	1,052,786	980,944	1,059,050	1,057,753	1,033,629
<u>OFF-THE-MALL</u>					
American Art & Portrait Gallery	397,232	368,595	373,105	346,057	344,358
Renwick Gallery	149,447	129,989	124,684	124,850	218,047
National Museum of African Art /2	75,238	50,312	43,661	32,915	-
Anacostia Museum	17,210	22,681	21,603	36,314	12,668
Cooper-Hewitt Museum	216,720	131,690	112,442	190,751	152,618
Natl. Zoological Park /3	3,300,000	3,300,000	3,100,000	3,300,000	3,500,000
GRAND TOTAL	28,009,358	34,223,518	26,930,696	26,337,877	29,244,231

/1 Opened to the public September 28, 1987.

/2 Off-Mall location closed to public June 1986.

/3 Number of visitors are estimates based on a sampling system.

Columbus Quincentenary Program

In 1985, the Smithsonian Institution initiated planning for a pan-institutional program to commemorate the 500th anniversary of the landing of Christopher Columbus in the Americas. For the Smithsonian, this occasion offers an opportunity to take a closer look at the past, present and future implications of the 1492 voyage. The Smithsonian Quincentennial observance will focus on the Americas with a creative mix of historical, topical and cultural issues and ideas. Plans are currently underway not only to commemorate the encounter of European and American civilizations, but also to draw attention to subsequent exchanges of ideas, material cultures, and flora and fauna. Through the organization of exhibitions and public and scholarly programs that explicate and celebrate five centuries of common experience in the Western hemisphere, the Smithsonian Institution will help shape the North American involvement in what assuredly will be an inter-hemispheric as well as transatlantic enterprise.

To achieve a broad pan-institutional program, it has been important to keep the parameters of the commemoration wide and not force a rigid thematic program. The bureaus have spent the previous two years in consultation with advisory boards composed of Smithsonian and non-Smithsonian scholars and experts resulting in the identification of individual program themes. Subsequently, the Quincentenary program was launched in FY 1987 with two of numerous public and scholarly symposia to be held through 1992. Also, research and related work has been initiated to prepare for the implementation exhibition and other public outreach plans. The various programs which have evolved out of numerous exchanges and consultations between Smithsonian staff and scholars from outside the Institution will contribute to a broader public understanding of complexity of issues surrounding the 1492 landfall. The following list includes those bureaus and offices requesting funds for Columbus Quincentenary programs:

	<u>Page Reference</u>
National Museum of Natural History	101
National Air and Space Museum	114
National Museum of American History	122
National Museum of American Art	130
Cooper-Hewitt Museum	164
Smithsonian Traveling Exhibition Service	190
Office of Folklife Programs	207
Office of Elementary and Secondary Education	221

SMITHSONIAN INSTITUTION
MUSEUM PROGRAMS AND RELATED RESEARCH
(SPECIAL FOREIGN CURRENCY PROGRAM)

1987 Appropriation.....	-0-	—		
1988 Appropriation.....	-0-			-- Equivalent in Excess
1989 Estimate.....	-0-	—		Foreign Currencies

PROGRAM OF GRANTS FOR RESEARCH

The Smithsonian Institution, through its Special Foreign Currency Program, makes grants to United States universities, museums, and other institutions of higher learning, including the Smithsonian itself, primarily for research and advanced professional training in fields of traditional Smithsonian competence.

Funding for this program through FY 1986 had been provided directly by appropriations in excess currencies received from Congress. Outlays from the budget authority appropriated through FY 1986 will continue through at least FY 1990, with outlays from the Forward-Funded Reserve for the American Institute of Indian Studies continuing into the 1990s. In addition, beginning in FY 1986, the Smithsonian has received allocations of U.S.-owned Indian rupees from the funds appropriated to the Department of State in FY 1985 for the establishment of the U.S.-India Fund for Educational, Cultural and Scientific Cooperation.

For more than 20 years, the Smithsonian program has been a major source of support for research carried out by United States institutions in those countries for which excess foreign currencies are available. (OMB Bulletin 87-17, issued on June 30, 1987, indicates that Poland and Burma are designated as excess currency countries for FY 1988.) While the full responsibility for the design, execution and publication of research results rests with a scholar working within the program of a United States institution, Smithsonian foreign currency grants have also strengthened the research and training activities of collaborating institutions abroad, since most projects directly involve host country institutions and scholars. Enduring professional ties which result from joint efforts and scholarly exchange contribute to the strongest form of United States cultural relations with other nations. Also, these ties contribute to the integration of the worldwide advancement of science which serves to narrow the gap between the industrial and the developing nations.

The rapid growth of world population and technological development has resulted in significant effects on the natural environment and on society. Research in the natural sciences and in cultural history sponsored by the Smithsonian through this Program is aimed in part at improving understanding of the environment and the management and conservation of scarce natural and cultural resources.

In FY 1987, ongoing research supported by these grants included the following projects of special interest:

Archeological and geomorphic studies at Ghazi Shah in Sind, Pakistan, are providing information on river channel, climatic and tectonic changes as they affected pre-historic settlement in the Lower Indus valley.

An ongoing exchange between Indian and United States astronomers is elucidating questions on applications of nuclear, elementary and relativistic physics to astrophysics.

Studies on the vegetation in the Bharatpur wetland in India are providing indices for predicting the impact of changes in water regime on vegetation development.

An exchange between United States and Pakistani folklorists, anthropologists and linguists is introducing new research techniques in music, foodways, language and art.

Studies of local technologies used in restoring pagodas and temples at earthquake-damaged Pagan in Burma are providing new low-cost solutions to worldwide preservation problems.

Further, with emphasis on information exchange through small workshops, symposia and field conferences, the Smithsonian is encouraging international research in specialized areas. In FY 1987, for example, United States scholars received support for participation in exchanges on the subjects of public culture, environmental education, astronomy, sociology, numismatics, primates, world capitalism, ancient sea trade, and snow leopards.

FORWARD-FUNDED RESERVE FOR THE AMERICAN INSTITUTE OF INDIAN STUDIES

Since 1967, the Smithsonian has provided annual funding through the Special Foreign Currency Program to the American Institute of Indian Studies (AIIS) for fellowships, research, symposia and publications and for administrative costs. The Smithsonian has helped sustain this Institute and other American research centers abroad for the last 20 years because of their significant contributions to scholarship and science without regard for national boundaries and their special service to American scholars conducting research.

During FY 1980 through FY 1985, a forward-funded reserve of \$7,170,000 equivalent in rupees was established for the AIIS to prevent the sudden termination of its programs after the removal of India from the excess currency list (which occurred at the end of FY 1985) and to provide it with interim funding for a period of years after the end of excess currency status. Beginning in FY 1986, the AIIS, with oversight from the Smithsonian, has drawn upon the funds from this reserve for its fellowship program and administration costs in India. Annual proposals continue to be examined through the Smithsonian's peer review system before each yearly increment is released from the reserve account. It is anticipated that the reserve will support AIIS programs through the 1990s in conjunction with continued support from the U.S.-India Fund.

U.S. - INDIA FUND FOR EDUCATIONAL, CULTURAL, AND SCIENTIFIC COOPERATION

In FY 1985, \$110 million equivalent in U.S.-owned Indian rupees was appropriated to the Department of State to establish the U.S.-India Fund for Educational, Cultural, and Scientific Cooperation. Beginning in FY 1986, the Smithsonian has received allocations from this fund to continue programs in India similar to those administered under the Special Foreign Currency Program which would otherwise have been discontinued when India was removed from the excess currency list in 1985. An amount of \$1.4 million was received in FY 1986, \$1.5 million in FY 1987, and \$1.8 million in FY 1988.

SMITHSONIAN INSTITUTION - FINANCIAL SUMMARY
Fiscal Years 1987 - 1989

(\$1,000)

	FY 1987 Actual	FY 1988 Projected	FY 1989 Budget
SI OPERATING FUNDS			
FUNDS PROVIDED:			
FEDERAL APPROP. - S&E	188,974	201,432	216,214
GOVERNMENT GRANTS & CONTRACTS	15,873	17,635	23,481
NON-APPROP. TRUST FUNDS			
Investment Income			
-Unrestr. General & Special Purpose	6,211	6,050	6,000
-Restricted	4,517	5,120	4,994
Gifts & Grants (Ex. Gifts to Endow)			
-Unrestr. General & Spec. Purpose	390	250	250
-Restricted	9,973	12,932	10,442
Self-Generated Revenues			
Institutional (Gen. Unrest.-Sch.F)			
-Gross Revenues	157,534	167,451	179,749
-Less Related Expenses	(130,748)	(140,866)	(154,359)
-Net Income	26,786	26,585	25,390
Bureau (Special Purpose)			
-Gross Revenues	9,203	8,357	8,989
-Less Related Expenses	(7,093)	(7,165)	(7,801)
-Net Income	2,110	1,192	1,188
Other Misc. - Unrestricted	5,224	1,599	1,575
-Restricted	2,028	1,200	1,200
Total Non-Approp. Trust Funds - Gross	195,080	202,959	213,199
-Net of Exps. of Self-Gen. Revs.	57,239	54,928	51,039
TOTAL ALL OPER. FUNDS PROVIDED:			
-Gross	399,927	422,026	452,894
-Net	262,086	273,995	290,734
FUNDS APPLIED:			
Research	56,452	59,378	67,912
Less: SAO Overhead Recovery	(2,545)	(2,956)	(3,062)
Museums	95,632	97,939	98,940
Public Service	5,301	5,011	5,243
International Activities	1,427	1,751	1,759
Special Programs	11,642	21,631	22,325
Associates Programs/Business Mgmt Administration	1,258	1,080	1,056
-Federal Appropriation	15,112	21,751	24,312
-Trust Funds	9,889	14,530	13,802
Less: SI Overhead Recovery	(9,305)	(10,340)	(10,980)
Facilities Services	57,271	59,336	62,897
TOTAL OPERATING FUNDS APPLIED	242,134	269,111	284,204
TRANSFERS (Non-Approp. Trust Funds)			
To Plant Funds	-	(38)	0
To Endowment Funds			
Unrestricted Purpose	3,278	3,026	3,026
Restricted Purpose	570	650	652
Total Transfers	3,848	3,638	3,678
CHANGE IN FUND BALANCE			
Unrest. & Special Purpose	12,246	1,630	2,519
Restricted (Incl. Fed. Grants & Contr.)	4,113	(384)	333
Total	16,359	1,246	2,852
FUND BALANCES - END OF YEAR			
Unrestricted & Special Purpose	38,935	40,565	43,084
Restricted (Incl. Fed Grants & Contr.)	13,769	13,385	13,718
Total Operating Fund Balances	52,704	53,950	56,802
OTHER FEDERAL APPROPRIATIONS			
-Foreign Currency Program	-	-	-
-Construction	21,570	28,719	36,290
TOTAL FEDERAL APPROPRIATIONS	210,544	230,151	252,504

Financial Report

Ann R. Leven, Treasurer

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 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 and 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, an increase of \$19.6 million over fiscal year 1986. A total of \$343,000, less than two tenths of one per cent 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 totalling \$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. The grantors gain access to Smithsonian expertise and resources, particularly in astrophysics and biological studies.

Trust funds, that is non-appropriated 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, \$2,634,000 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 non-appropriated funds during fiscal year 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 50th 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%
Gov't Gr. 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 underway: 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% over the previous year, reflecting an increased emphasis placed upon 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 for the Quadrangle was undertaken in fiscal year 1987 within the Smithsonian family 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 latter 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 17th 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's sales enabled 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, the Institution receives in addition to its appropriation for salaries and other operating expenses, 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 Olmstead 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 its 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 18.3% loss from September 30 versus a 25.3% 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% equities, 21% fixed income, and 18% 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 their time and expertise, Regent Barnabas McHenry, who serves as Chair, Regent Carlisle H. Humelsine, Donald Moriarty, Charles H. Mott, William R. Salomon, Thomas J. Watson, and Jane Mack 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. Federal employees number approximately 4,300; there are 1,300 non-federal or trust funded employees.

Equal gratitude goes to over 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 efforts of staff in the Office of Personnel Administration, 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 yielding a wealth of comparative statistical data.

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 Africa 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 sales. While still a very healthy contributor to unrestricted trust funds, Mail Order did not experience the growth of past years, leading to a re-evaluation of the Institution's 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% over the prior 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. 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 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. Fiscal, administrative, and other support services in addition to office space are provided by the Smithsonian to the Woodrow Wilson International Center for Scholars on a reimbursement basis. Administrative services are provided by the Institution on a contract basis to Reading Is Fundamental. Office space continues to be provided to Visions Foundation, Inc., a non-profit organization which publishes American Visions magazine. An independent non-profit operation, the Friends of the National Zoo, operates under contract for the benefit of the National Zoological Park.

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	195,060
- Net	42,891	57,239
Total Operating Funds Provided - Gross	359,380	399,927
- Net	\$ 227,909	\$ 262,086
FUNDS AFFLIED:		
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	\$ 230,118	\$ 245,727
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	\$ (2,309)	\$ 16,359
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	\$ 36,345	\$ 52,704
OTHER FEDERAL APPROPRIATIONS **		
Special Foreign Currency Program	\$ 2,378	\$ —
Construction	19,621	21,570
Total Federal Appropriation (Including S & E above).....	\$ 191,383	\$ 210,544

* 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 FY 1987 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 Nonfederal 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	—	5173	2,028	—
Total Provided	188,974	210,953	5,436	157,534	15,592	16,518	15,873
Total Available	\$ 188,974	\$ 247,298	\$ 7,480	\$ 157,534	\$ 40,237	\$ 26,174	\$ 15,873
FUNDS APPLIED:							
Research:							
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	35,531	19,168	1,044	—	3,149	1,331	13,644
Museums:							
Assistant Secretary	593	163	140	—	17	6	—
Museum Programs	428	399	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	8940	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	4618	3,413	39	—	2742	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	—	2653	399	123
Total Museums	72,137	28,108	2,321	0	14,304	9,906	1,677

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 Nonfederal Funds	Unrestricted			Restricted	
			General	Auxiliary Activities	Special Purpose	General	Government Grants and Contracts
Public Service:							
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
Special Programs:							
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	7,708	4,002	1,023	—	2,179	270	530
Associate Programs	—	81,286	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	—
Transfers Out/ (In):							
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 \$1,000's)

	Investment	Gifts	Miscellaneous	Total revenue	Deductions	Transfers in (out)	Net increase (decrease)	Fund balance and of year
FY 1986	\$ 4,046	\$ 6,318	\$ 2,950	\$ 13,314	\$ 10,622	\$ (2,348)	\$ 344	\$ 9,556
FY 1987:								
Astrophysical Observatory	\$ 32	\$ 17	\$ —	\$ 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	284	817
Museum Programs	11	155	—	166	726	—	(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	651	—	135	381
National Portrait Gallery.....	14	178	—	192	208	—	(16)	180
Hirshhorn Museum	135	175	1,398	1,668	990	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	27	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)	80
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	162	51
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	11,145	11,849
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	3,000	3,034
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 \$1,000's)

Activity	Sales and membership revenue	Gifts	Less cost of sales	Gross revenue	Expenses	Net revenue* (loss)
FY 1986	\$ 142,511	\$ 3,853	\$ 84,669	\$ 61,695	\$ 42,062	\$ 19,633
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.....	\$ 153,057	\$ 4,477	\$ 87,820	\$ 69,714	\$ 42,928	\$ 26,786

* 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 \$1,000's)

	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	\$ 856	\$ 6,802	\$ 2,205	\$ 9,863	\$ 8,843	\$ 13,153	\$ 4,840	\$ 813	\$ 24,645
FY 1987:									
Astrophysical Observatory.....	53	318	66	437	1,714	1,207	173	771	1,950
S40 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 Exhibitions 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	66	485	740	1,311	1,238	2,170	384	(5)	3,126
TOTAL FY 1987	\$ 900	\$ 9,203	\$ 5,489	\$ 15,592	\$ 16,714	\$ 16,099	\$ 7,093	\$ 9,114	\$ 33,759

*For Inclusion: 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.....	\$ 165	\$ 6	\$ 0	\$ 22	\$ 1,012	\$ 1,205

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	\$ 5280	\$ 2500
Restoration and Renovation of Buildings	10,536	12,975
Quadrangle	3,805	3,315
Tupper Research Center.....	—	2780
Total Federal Appropriations	19,621	21,570
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	—	1557
National Zoological Park Japanese Crab Exhibit	—	30
Dulles Shelter	—	16
Total Income	2,640	5,367
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	87	160
Total Funds Provided	\$ 22,348	\$ 27,097

* 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 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	\$130,684	\$131,113	\$147,300	\$179,790	\$232,751

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
Mussinán, 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	55,798
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	12,521
Lyon, Marcus Ward, Jr. (Designated)	20,292	22,572	538	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

	Principal		Income	
	Book Value	Market Value	Net Income	Unexpended Balance
RESTRICTED PURPOSE--TRUE:				
Arthur, James	\$189,056	\$249,204	\$7,014	\$9,469
Baird, Spencer 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	14,340
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
Roebling Fund	568,621	747,882	21,050	322
Rollins, Miriam and William	1,121,689	1,380,698	38,554	4,681
Sias, 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

TABLE 13 Endowment Funds September 30, 1987

	Principal		Income	
	Book Value	Market Value	Net Income	Unexpended Balance
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
RESTRICTED PURPOSE--QUASI:				
Armstrong, Edwin James	17,137	19,539	541	0
Au Panier Fleuri	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	3,469
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	19,989
Rathbun, Richard, Memorial	56,278	68,187	1,919	19,614
Roebling Solar Research	124,620	146,603	4,126	18,665
Ruef, Bertha M.	146,912	163,637	4,606	5,201
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	\$105,105,569	\$125,195,587	\$3,518,702	\$3,612,765
TOTAL ENDOWMENT FUNDS	\$201,110,765	\$234,120,769	\$6,524,006 **	\$4,064,853

*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

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To the Board of Regents
Smithsonian Institution

We have examined the statement of financial condition of the Smithsonian Institution 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 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, 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 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

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SMITHSONIAN INSTITUTION
STATEMENT OF FINANCIAL CONDITION
September 30, 1987
(with comparative totals for September 30, 1986)
(thousands of dollars)

	<u>Trust funds</u>	<u>Federal funds</u>	<u>Totals, all funds</u>	<u>Totals, 1986</u>
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)	<u>56,194</u>	<u>221,629</u>	<u>277,823</u>	<u>258,097</u>
Total assets	<u>\$399,117</u>	<u>\$333,103</u>	<u>\$732,220</u>	<u>\$643,807</u>
Liabilities:				
Accounts payable and accrued expenses, in- cluding interfund pay- able 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)	<u>13,812</u>	<u>-</u>	<u>13,812</u>	<u>3,748</u>
Total liabilities	<u>86,410</u>	<u>25,849</u>	<u>112,259</u>	<u>100,721</u>
Undelivered orders (Note 1)	<u>-</u>	<u>67,277</u>	<u>67,277</u>	<u>59,368</u>
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)	<u>58,892</u>	<u>-</u>	<u>58,892</u>	<u>53,007</u>
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	<u>-</u>	<u>223,042</u>	<u>223,042</u>	<u>214,101</u>
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, un- delivered 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		Federal funds			Totals, 1986
	Totals, trust funds	Current funds	Endowment and similar funds	Plant funds	Totals, federal funds	
Revenue and other additions:						
Appropriations	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Auxiliary activities revenue	161,740	161,740	-	-	161,740	161,740
Government grants and contracts	15,873	15,873	-	-	15,873	15,873
Investment income	12,491	11,278	1,213	-	12,491	12,491
Net gain on sale of securities	35,315	-	35,315	-	35,315	35,315
Gifts, bequests and foundation grants	19,330	14,841	336	4,153	19,330	19,330
Additions to plant	8,088	-	-	8,088	8,088	8,088
Rentals, fees, commissions and other	8,000	8,000	-	-	8,000	8,000
Total revenue and other additions	260,837	211,732	35,651	13,454	240,109	240,109
Expenditures and other deductions:						
Research, educational, and collection acquisition expenditures (Note 10)	45,707	45,707	-	-	45,707	45,707
Administrative expenditures	12,878	12,878	-	-	12,878	12,878
Facilities services expenditures	2,072	2,072	-	-	2,072	2,072
Auxiliary activities expenditures	131,093	131,093	-	-	131,093	131,093
Acquisition of plant and other	6,556	-	-	6,556	6,556	6,556
Property use and retirements (Note 7)	1,173	-	-	1,173	1,173	1,173
Retirement of and interest on indebtedness	-	-	-	-	-	-
Total expenditures and other deductions	199,479	191,750	-	7,729	232,158	232,158
Excess of revenue and other additions over expenditures and other deductions	61,358	19,982	35,651	5,725	7,951	7,951
Transfers among funds - additions (deductions) (Note 11)	-	(3,623)	3,463	160	-	-
Net increase (decrease) for the year	61,358	16,359	39,114	5,885	7,951	7,951
Returned to U. S. Treasury	-	-	-	-	(343)	(343)
Fund balances at beginning of year	251,349	36,345	161,997	53,007	232,369	232,369
Fund balances at end of year (Note 9)	\$312,707	\$ 52,704	\$201,111	\$58,892	\$239,977	\$239,977
					\$ 388	\$ 388
					15,952	15,952
					214,101	214,101
					483,718	483,718
					\$552,684	\$552,684
					69,309	69,309
					(343)	(343)
					38,423	38,423
					(185)	(185)
					445,480	445,480
					\$483,718	\$483,718
					18,400	18,400
					20,069	20,069
					167	167
					404,999	404,999
					431,637	431,637
					69,309	69,309
					38,423	38,423
					18,896	18,896
					20,975	20,975
					595	595
					192,287	192,287
					(1,585)	(1,585)
					8,941	8,941
					69,309	69,309
					38,423	38,423
					(185)	(185)
					445,480	445,480
					\$552,684	\$552,684
					18,400	18,400
					20,069	20,069
					167	167
					404,999	404,999
					431,637	431,637
					69,309	69,309
					38,423	38,423
					(185)	(185)
					445,480	445,480
					\$483,718	\$483,718
					18,400	18,400
					20,069	20,069
					167	167
					404,999	404,999
					431,637	431,637
					69,309	69,309
					38,423	38,423
					(185)	(185)
					445,480	445,480
					\$483,718	\$483,718

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

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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 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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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,

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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 equipment 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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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 <u>(\$000s)</u>	Market value <u>(\$000s)</u>
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>

Continued

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SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

	Carrying value <u>(\$000s)</u>	Market value <u>(\$000s)</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):

	<u>Market</u>	<u>(\$000s) Cost</u>	<u>Net change</u>	<u>Market value per unit</u>
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>

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

4. Endowment and similar funds

The fund balances for the endowment and similar funds at September 30, 1987 are summarized as follows:

	<u>(\$000s)</u>
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) 4-1/2% 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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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:

	<u>(\$000s)</u>
<u>Federal funds</u>	
Amount to be provided for accrued annual leave	\$ 8,199
Service fees and charges	<u>194</u>
	<u>8,393</u>
 <u>Trust funds</u>	
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.

Continued

SMITHSONIAN INSTITUTION
 NOTES TO FINANCIAL STATEMENTS

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>
<u>Federal</u>		
<u>Capital funds</u>		
Property	\$ 329,272	
Equipment	37,487	
Less accumulated depreciation	<u>(145,130)</u>	
Total, federal funds		<u>\$221,629</u>
<u>Trust</u>		
<u>Current funds</u>		
Capital improvements	9,343	
Equipment	7,258	
Leasehold improvements	1,558	
Less accumulated depreciation and amortization	<u>(7,372)</u>	
		<u>10,787</u>

Continued

SMITHSONIAN INSTITUTION
 NOTES TO FINANCIAL STATEMENTS

Endowment and similar funds

Land 240

Plant funds

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>
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Total, all funds		<u><u>\$ 277,823</u></u>
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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

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

<p>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</p>	\$ 2,000
<p>Noninterest-bearing note payable for purchase of food service equipment, due monthly commencing September 18, 1987 through July 21, 1990</p>	412
<p>9% note payable for purchase of Folkways Records and Service Corporation, due in four annual installments commencing December 31, 1987</p>	<u>400</u>
	<u><u>\$13,812</u></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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

The federal operating funds for the year ended September 30, 1987 included the following:

	<u>Additions (\$000s)</u>		<u>Fund Balance at Septem- ber 30, 1987</u>
	<u>Appropriations</u>	<u>Other</u>	
Salaries and expenses	\$188,974	\$ -	\$ -
Special Foreign Currency Program	-	-	173
U. S. India Fund (trans- fers 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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

11. Transfers among funds

The following transfers among trust funds were made for the year ended September 30, 1987 in thousands of dollars:

	<u>Current funds</u>		<u>Endowment and similar funds</u>	<u>Plant funds</u>
	<u>Unrestricted</u>	<u>Restricted</u>		
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	<u>(3,278)</u>	<u>(453)</u>	<u>3,731</u>	<u>-</u>
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.

Continued

SMITHSONIAN INSTITUTION
NOTES TO FINANCIAL STATEMENTS

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.

FY 1988 APPROPRIATION

(Dollars in Thousands)

UNIT	FY 1988 CONGRESSIONAL APPROPRIATION	NEW POSITION LAPSE	QUINCEN- TENARY REDUCTION	REPRO- GRAMMINGS	GRADE TARGET REDUCTION	REVISED FY 1988 APPROPRIATION
RESEARCH						
Assistant Secretary for Research	1,263	0	0	(54) /1	(4)	1,205
Astrophysical Observatory	10,467	(23)	0	(525) /2	(27)	9,892
Tropical Research Institute	5,286	(46)	0	0	(9)	5,231
Environmental Research Center	1,376	0	0	0	(3)	1,373
National Zoological Park	13,068	(69)	0	0	(20)	12,979
Smithsonian Institution Archives	579	0	0	0	(2)	577
Smithsonian Institution Libraries	5,089	(8)	0	0	(11)	5,070
Major Scientific Instrumentation	0	0	0	525 /2	0	525
Subtotal, Research	37,128	(146)	0	(54)	(76)	36,852
MUSEUMS						
Assistant Secretary for Museums	1,086	0	0	0	(3)	1,083
National Museum of Natural History	23,968	(154)	(10)	34 /3	(76)	23,762
National Air and Space Museum	9,037	(6)	(6)	0	(20)	9,005
National Museum of American History	13,648	(73)	(31)	0	(44)	13,500
National Museum of American Art	5,050	0	0	0	(14)	5,036
National Portrait Gallery	4,069	(16)	(5)	0	(10)	4,038
Hirshhorn Museum and Sculpture Garden	3,351	(3)	(7)	0	(6)	3,335
Center for Asian Art	3,936	(29)	0	0	(8)	3,899
Archives of American Art	1,041	0	0	0	(3)	1,038
Cooper-Hewitt Museum	1,076	0	0	0	(2)	1,074
National Museum of African Art	3,401	(12)	0	0	(4)	3,385
Anacostia Museum	931	0	0	0	(2)	929
Conservation Analytical Laboratory	2,418	0	0	0	(9)	2,409
Office Exhibits Central	1,841	(6)	0	0	(5)	1,830
Traveling Exhibition Service	691	(4)	(65)	0	(2)	620
Subtotal, Museums	75,544	(303)	(124)	34	(208)	74,943
PUBLIC SERVICE						
Assistant Secretary for Public Service	1,305	0	0	(34) /4	(4)	1,267
Smithsonian Institution Press	1,197	0	0	0	(5)	1,192
Subtotal, Public Service	2,502	0	0	(34)	(9)	2,459
OFFICE OF INTERNATIONAL ACTIVITIES	818	0	(30)	0	(1)	787
SPECIAL PROGRAMS						
American Studies and Folklife Programs	806	0	(10)	0	(2)	794
Intl Environmental Science Program	750	0	0	0	0	750
Academic and Educational Programs	896	(6)	0	88 /1 /4	(2)	976
Museum Support Center	4,475	0	0	0	0	4,475
Subtotal, Special Programs	6,927	(6)	(10)	88	(4)	6,995

UNIT	FY 1988 CONGRESSIONAL APPROPRIATION	NEW POSITION LAPSE	QUINCEN- TENARY REDUCTION	REPRO- GRAMMINGS	GRADE TARGET REDUCTION	REVISED FY 1988 APPROPRIATION
ADMINISTRATION	21,142	(98)	0	380 /3 /5	327	21,751
FACILITIES SERVICES						
Office of Design and Construction	2,261	0	0	0	(11)	2,250
Office of Protection Services	19,419	(41)	0	0	(9)	19,369
Office of Plant Services	36,455	(6)	0	(414)/5	(9)	36,026
Subtotal, Facilities Services	58,135	(47)	0	(414)	(29)	57,645
New Staffing - lapse	(600)	600				
Columbus Quincentenary	(164)		164			
GRAND TOTAL	201,432	0	0	0	0	201,432

- /1 Reflects permanent transfer of 1 position from Office of the Assistant Secretary for Research to the National Science Resources Center.
- /2 Reflects transfer of base resources for the Multiple-Mirror-Telescope conversion from the Smithsonian Astrophysical Observatory line item to Major Scientific Instrumentation.
- /3 Reflects transfer of 1 position from the Office of Printing and Photographic Services to the National Museum of Natural History.
- /4 Reflects permanent transfer of 1 position from the Office of the Assistant Secretary for Public Service line item to the National Science Resource Center.
- /5 Reflects permanent transfer of Office of Plant Services' Communications Division (16 positions) to the Office of Information Resource Management.

SMITHSONIAN INSTITUTION LIBRARIES



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