



Smithsonian Institution

*Report of the Secretary and the Financial Report
of the Executive Committee of
the Board of Regents*



1963



Smithsonian Institution

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the Board of Regents*



For the year ended June 30

1963



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Institution

Report of the Secretary and Financial Report
of the Board of Regents
of the Smithsonian Institution

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THE SMITHSONIAN INSTITUTION

June 30, 1963

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Division of Ethnology: S. H. Riesenbergs, curator; G. D. Gibson, E. I. Knez, W. H. Crocker, associate curators.

Division of Physical Anthropology: J. L. Angel, curator.

DEPARTMENT OF ZOOLOGY: H. H. Hobbs, Jr., head curator; F. A. Chace, Jr., senior scientist; W. M. Perrygo, in charge of taxidermy.

Division of Mammals: D. H. Johnson, curator; H. W. Setzer, C. O. Handley, Jr., associate curators.

Division of Birds: P. S. Humphrey, curator, G. E. Watson, assistant curator.

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Division of Marine Invertebrates: D. F. Squires, curator; T. E. Bowman, C. E. Cutress, Jr., Marian H. Pettibone, R. R. Manning, associate curators.

Division of Mollusks: H. A. Rehder, curator; J. P. E. Morrison, Joseph Rosewater, associate curators.

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Division of Ferns: C. V. Morton, curator.

Division of Grasses: J. R. Swallen, acting curator; T. R. Soderstrom, associate curator.

Division of Cryptogams: M. E. Hale, Jr., curator; P. S. Conger, H. E. Robinson, R. E. Norris, associate curators.

Division of Plant Anatomy: W. L. Stern, curator; R. H. Eyde, associate curator.

DEPARTMENT OF GEOLOGY: G. A. Cooper, head curator.

Division of Mineralogy and Petrology: G. S. Switzer, curator; E. P. Henderson, P. E. Desautels, associate curators; R. S. Clarke, Jr., chemist.

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Division of Vertebrate Paleontology: C. L. Gazin, curator; D. H. Dunkle, Nicholas Hotton III, associate curators; F. L. Pearce, exhibits specialist.

OCEANOGRAPHY PROGRAM: I. E. Wallen, assistant director; H. A. Fehlmann, supervisory museum specialist, Smithsonian Oceanographic Sorting Center.

MUSEUM OF HISTORY AND TECHNOLOGY

Director.—F. A. Taylor.

Assistant Director.—J. C. Ewers.

Administrative officers.—W. E. Boyle, Virginia Beets.

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Division of Physical Sciences: R. P. Multhauf, acting curator; W. F. Cannon, associate curator.

Division of Mechanical and Civil Engineering: S. A. Bedini, curator; E. A. Battison, R. M. Vogel, associate curators.

Division of Transportation: H. I. Chapelle, curator; K. M. Perry, J. H. White, Jr., associate curators.

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Division of Medical Sciences: S. K. Hamarneh, curator.

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Division of Textiles: Mrs. Grace R. Cooper, curator.

Division of Ceramics and Glass: P. V. Gardner, curator; J. J. Miller II, assistant curator.

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Division of Manufactures and Heavy Industries: P. W. Bishop, acting curator.

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Division of Political History: W. E. Washburn, curator; Mrs. Margaret Brown Klapthor, associate curator; H. R. Collins, K. E. Melder, Mrs. Anne W. Murray, assistant curators.

Division of Cultural History: C. M. Watkins, curator; Rodris C. Roth, associate curator; A. W. Hathaway, Mrs. Cynthia A. Hoover, J. N. Pearce, assistant curators.

Division of Philately and Postal History: F. J. McCall, associate curator in charge; C. H. Scheele, assistant curator.

Division of Numismatics: Vladimir Clain-Stefanelli, curator; Mrs. Elvira Clain-Stefanelli, associate curator; Barbara F. Bode, junior curator.

DEPARTMENT OF ARMED FORCES HISTORY: M. L. Peterson, head curator.

Division of Military History: E. M. Howell, curator; C. R. Goins, Jr., associate curator.

Division of Naval History: P. K. Lundeberg, curator; M. H. Jackson, associate curator.

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Museum of History and Technology Laboratory: B. W. Lawless, chief; B. S. Bory, production supervisor.

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- Director.*—T. H. Reed.
Associate Director.—J. L. Grimmer.
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Zoologist.—Marion McCrane.
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Assistant Chief.—W. Shropshire.
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Geochemist.—J. J. Sigalove.
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Curator.—R. B. Meyer.

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National Portrait Gallery Commission:

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*Honorary Smithsonian Fellows, Collaborators, Associates, Custodians of
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John E. Graf
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UNITED STATES NATIONAL MUSEUM

MUSEUM OF NATURAL HISTORY

Anthropology

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G. H. Cole, Archeology.
Albert Jamme, Archeology.
N. M. Judd, Anthropology.
H. W. Krieger, Ethnology.

Betty J. Meggers, Archeology.
F. M. Setzler, Anthropology.
H. Morgan Smith, Archeology.
W. W. Taylor, Jr., Anthropology.
W. J. Tobin, Physical Anthropology.

Zoology

O. L. Austin, Birds
W. W. Becklund, Helminthology.
Mrs. Doris H. Blake, Insects.
J. Bruce Bredin, Biology.
W. L. Brown, Mammals.
M. A. Carriker, Jr., Insects.
Ailsa M. Clark, Marine Invertebrates.
H. G. Deignan, Birds.
C. J. Drake, Insects.
K. C. Emerson, Insects.
Herbert Friedmann, Birds.
F. M. Hull, Insects.
Laurence Irving, Birds.

W. L. Jellison, Insects.
Allen McIntosh, Mollusks.
J. P. Moore, Marine Invertebrates.
C. F. W. Muesebeck, Insects.
W. L. Schmitt, Marine Invertebrates.
Benjamin Schwartz, Helminthology.
T. E. Snyder, Isoptera.
H. K. Townes, Insects.
Robert Traub, Mammals.
Alexander Wetmore, Birds.
Mrs. Mildred S. Wilson, Copepod Crustacea.

Botany

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Mrs. Agnes Chase, Grasses.
E. P. Killip, Phanerogams.
E. C. Leonard, Phanerogams.

F. A. McClure, Grasses.
Mrs. Kittle F. Parker, Phanerogams.
J. A. Stevenson, Fungi.
W. N. Watkins, Woods.

Geology

C. W. Cooke, Invertebrate Paleontology.
J. T. Dutro, Invertebrate Paleontology.
A. A. Olsson, Invertebrate Paleontology.

W. T. Schaller, Mineralogy.
W. P. Woodring, Invertebrate Paleontology.

MUSEUM OF HISTORY AND TECHNOLOGY

Science and Technology

D. J. Price

Civil History

Mrs. Arthur M. Greenwood, Cultural History.	F. W. McKay, Numismatics.
E. C. Herber, History.	Emery May Norweb, Numismatics
I. N. Hume, Cultural History.	R. Henry Norweb, Numismatics

Armed Forces History

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F. C. Lane.	

Exhibits

W. L. Brown, Taxidermy

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M. W. Stirling.	

ASTROPHYSICAL OBSERVATORY

C. G. Abbot

FREER GALLERY OF ART

Oleg Grabar.	Max Loehr.
Grace Dunham Guest.	Katherine N. Rhoades.

NATIONAL AIR MUSEUM

Frederick C. Crawford.	Alfred V. Verville.
John J. Ide.	

NATIONAL ZOOLOGICAL PARK

E. P. Walker

CANAL ZONE BIOLOGICAL AREA

C. C. Soper

Report of the Secretary of the Smithsonian Institution

LEONARD CARMICHAEL

For the Year Ended June 30, 1963

To the Board of Regents of the Smithsonian Institution:

GENTLEMEN: I have the honor to submit a report showing the activities and condition of the Smithsonian Institution and its branches for the fiscal year ended June 30, 1963.

GENERAL STATEMENT

James Smithson directed that the Institution founded by him should be an establishment for the *increase and diffusion of knowledge among men*. The 117th year of the Smithsonian Institution, covered in the present report, shows notable achievements in research; that is, in the *increase of knowledge*. The publications, museum displays, and the answering of letters requesting information have all served during the year to further *the diffusion of knowledge*.

In the pages that follow, reports of the activities of each of the bureaus of the Smithsonian present in some detail the story of the year. Additions to the collections, publications, new exhibits, new research findings, and explorations are all described.

The year's most notable development has been the progress made in the completion of the great new Museum of History and Technology Building. This marble structure will be one of the largest and one of the most modern and effective museums in the world. Its 50 public exhibition halls will almost certainly be viewed each year by at least 5 million visitors. The building has been planned so that access to exhibits and the movement of visitors through the halls will be as convenient as possible and produce a minimum of what is often all too accurately called "museum fatigue." In planning each new exhibit an effort has been made to make every display a complete instructional unit. Space has also been set aside for the great study collections of the Institution in the fields of history and technology, containing objects that are not on public exhibition but that are of importance to the thousands of research scholars, specialists, and collectors who come to the Smithsonian every year to learn more in detail about some particular field of inquiry.

The new east-wing addition to the National History Building, virtually completed by the end of the year, has been occupied by staff scientists. Many of the great biological and geological study and research collections of the Institution have been moved into space provided in this wing. The completion of these additional facilities, when supplemented by the later completion of the west wing, will again allow the opening of some large public halls of the Natural History Building that have had to be closed for many years in order to provide space for research activities. During the more than 50 years between the completion of this great Natural History Building and the construction of these new wings, much exhibition space had necessarily been encroached upon. Now these fine halls, originally planned for natural-history exhibitions, can be returned to their proper use.

As noted in the reports that follow, physical improvements have also been carried on at the National Zoological Park. Planning has also been completed for the renovation of the old Patent Office Building. This building, by an act of Congress, has been assigned to the Smithsonian Institution as the new home of the National Collection of Fine Arts and of the new National Portrait Gallery.

The Decade 1953-63

Each annual report of the Smithsonian Institution describes the advances that have been made in a single period of 12 months. It may not be inappropriate occasionally in an annual report to summarize accomplishments and changes that have taken place in the Institution over a longer period of time. The decade 1953-63 has been one marked by much progress at the Institution. As the present report is the last one that will be submitted to the Board of Regents by the present Secretary, it has seemed fitting to review here briefly some of the highpoints of this 10-year period. These years cover the major period of tenure of the present Secretary.

It must be emphasized that all the advances made at the Smithsonian Institution during the period under review are a result of the actions and support of the Board of Regents of the Smithsonian Institution and of the Congress of the United States.

In the paragraphs that follow, brief summaries are presented of some of the major activities in this notable decade of each of the bureaus of the Smithsonian.

United States National Museum, 1953-63

Ten years ago, as at the present time, the United States National Museum consisted of two major sections. The Natural History Museum, in terms of national and indeed international recognition, prob-

ably the best known part of the Museum, has developed in the decade under consideration in an outstanding way. The other section, now called the Museum of History and Technology, has seen an equally important development.

In 1953 there were more than 34 million cataloged objects in the National Museum of the Smithsonian Institution. By 1963 this number had grown to over 57 million such objects. Sometimes those who do not know intimately the work of the Smithsonian ask why the collections have been allowed to develop so rapidly. The answer, of course, is that the scientific work of the Smithsonian depends very largely upon the use of these study collections by literally thousands of competent investigators. Much of the world-famous scientific study of insects, of plants, of minerals, and of other areas of the natural resources of our Nation that is carried out at the Smithsonian Institution, could not be performed if it were not for the presence of these great, and in many cases unique, assemblages of carefully documented and labeled scientific specimens. During the decade under consideration the staff of the Natural History Museum has been markedly strengthened so that it can more adequately perform necessary investigations related to these collections. Much of this research has specific applications to medicine, especially military medicine, the effect of radiation on living cells, insect control, general problems of conservation, the development of food resources, and the scientific knowledge of the natural history of the earth.

Field investigations conducted by the Museum have more than doubled in number during this decade, and nearly all of them have been conducted, not with funds appropriated to the Smithsonian, but with gifts or grants made by individuals, foundations, or government agencies. Recently the Smithsonian Oceanographic Sorting Center was established to receive, screen, sort, and distribute for scientific study the animals, plants, and minerals collected in the expanding oceanographic program of the United States. Public and private funds have also made it possible for the Smithsonian to participate in the development of techniques for underwater scientific study.

Only 10 years ago most of the corridors of the great Natural History Museum Building were lined from floor to ceiling with cases containing the working scientific reference collections of the Institution. Scientists were required to work on stepladders and in walled-off stairwells or behind screens in exhibition halls. In 1958 Congress appropriated funds for the design of desperately needed additions to the Natural History Building that had been authorized many years before. The east wing, now complete, has added 214,000 square feet of space to allow the proper and effective housing of scientific collections of the Smithsonian. Funds have also been appropriated to allow the erection

of the symmetrically matching west wing. Work on the building of this wing is expected to start in calendar year 1963.

In 1953 the 72-year-old Arts and Industries Building was rather generally known in the American press as the "nation's attic." This old building for years had led most of the rest of the museums of the world in the popularity of its exhibits as measured by annual attendance, but it was almost pathetically inadequate to accommodate its great collections or to provide adequately for the tremendous crowds that pushed into it day after day. In 1955 Congress authorized the construction of a new building to be known as the Museum of History and Technology of the Smithsonian Institution. This additional magnificent building is now nearing completion and will soon be equipped with exhibits and be open to the public. The old Arts and Industries Building will not be abandoned but will be used for special exhibits and for the display of important objects that are appropriate for its large halls.

During the decade under review, historians of science and technology, some of them recent additions to the staff of the Institution, have systematized the collections of the Smithsonian in both history and technology. They have developed modern exhibits and have prepared scholarly publications to present to the world the results of their investigations of the collection of treasures housed at the Smithsonian. Until the beginning of this decade most of the publications of the Smithsonian Institution were in fields of study related to the sciences of astronomy, anthropology, botany, zoology, and geology. Today more than 250 monographs and books have been published to provide a scholarly basis for the understanding of some of the great collections of objects in the Museum of History and Technology.

These new Smithsonian publications and the new exhibits in the fields of history and technology have brought to the attention of collectors all over America, and indeed all over the world, the significance of the Smithsonian's work. New interest in the Institution's collections in the field of the decorative arts, and in the collections of furniture, silver, ceramics, textiles, and prints, has been especially notable. Increasingly during these years Smithsonian experts have taken important parts in the programs of seminars and museum conferences dealing with the preservation and understanding of objects in these fields. New methods of examination, interpretation, exhibition, and, above all preservation have been developed during this time in the workrooms and laboratories of the Smithsonian.

During this period the Institution has participated in excavations at a number of colonial American sites. Nearly all this work has been fully or partly supported by funds provided from private sources. As a result of these studies new knowledge has come concerning the

mode of life of Americans during the early years of the country, and the pottery, weapons, insignia, tools, and trade objects of our young nation are now much better understood than they were 10 years ago.

One of the prime reasons for the vast increase in the number of visitors at the Smithsonian museums has been the development that has taken place in this decade in the presentation of exhibits. It is not by chance that the number of visitors in the old Smithsonian buildings on the Mall in 1952-53 totaled 3,429,000, whereas the number in 1963 reached the amazing figure of 10,309,000. Since 1953, 28 large exhibition units have been transformed from halls full of poorly lighted cases crammed with objects to well-labeled, modern, teaching exhibits. It is not an exaggeration to say that the truly creative work of the exhibit staff of the Smithsonian has become famous, not only in every other great museum of America but also in all the large museums in the rest of the world.

A few additional notes may be made concerning developments in particular areas of interest:

The Institution has long had one of the great collections of musical instruments of the country. Unfortunately, most of these were not in condition to be played and were not easily viewed. Many of the most important have been restored and can now be played. Some of them have been used in concerts provided free for the public by volunteer musicians. A scientific analytical laboratory has been established at the Smithsonian, and here physical and chemical techniques are now employed in the important task of providing better methods for protecting and conserving the treasures of the Smithsonian. During this decade the White House has been generally renovated. Under the direction of the President of the United States and the staff of the White House, the Smithsonian has played a role in the development of exhibits of the history of the White House as now displayed in the visitor's entrance to this historic center of our Nation. An act of Congress, passed in 1961, provided that objects not needed for use or display at any time at the White House are to be transferred to the Smithsonian Institution.

Annual reports of the Smithsonian list the splendid donations that come to the Institution in each 12-month period. Among the especially notable gifts of the decade may be mentioned the following:

President John F. Kennedy presented a magnificent volume, the "Atlas Nouveau" by Nicolas Sanson, 1692, beautifully bound for the instruction of the Dauphin of France.

Mrs. Arthur M. Greenwood gave many objects illustrating American colonial living, including an entire two-story, four-bedroom house built in Massachusetts in 1678.

The Honorable and Mrs. Wiley T. Buchanan, Jr., purchased for the Museum 600 fine examples of early Rhenish and Dutch pottery; Harry Winston gave the great blue Hope Diamond; and the estate of Mrs. Maude Monell Vetlesen, through her son Edmund C. Monell, donated 130 pieces of beautifully carved jade ranging in age from the Ming through the Ching dynasties.

Dr. Hans Syz began presenting in annual installments one of the outstanding privately owned collections of fine European porcelain of the earliest period. Mrs. Herbert Arthur May made gifts of laces, glass, Americana, Indian materials, and the magnificent necklace of diamonds which Napoleon I gave to the Empress Marie-Louise on the occasion of the birth of their son in 1811.

Lessing J. Rosenwald presented an outstanding English astrolabe of 1325 and a 16th-century folding sundial compass engraved with maps and travel routes of central Europe. The International Business Machines Corp. presented 21 beautifully engraved astrolabes from Persia, India, North Africa, and Europe of the 13th and later centuries, and 24 rare pre-Spanish textiles.

Willis H. du Pont made two outstanding gifts: a collection of coins and medals struck in the name of Peter the Great, with a copy of the rare 11-volume monograph on Russian coins by the Grand Duke Georgii Mikhailovitch; and 860 coins and medals issued in the reigns of Czar Ivan III and Czarina Elizabeth, also from the Grand Duke's collection.

The family of the late Henry T. Peters presented nearly 2,000 lithographs by American printmakers other than Currier and Ives, from the "America on Stone" collection.

Mrs. W. Murray Crane presented a fine collection of French and English furniture of the 18th century, and the Misses Helen R. and Elizabeth W. Newcombe gave the complete furnishings of a 19th-century American parlor.

Senator Clinton P. Anderson, Regent of the Smithsonian, presented a fine copy of the Kelmscott Chaucer printed by William Morris in 1896; and the late Mrs. Richard Saltonstall, mother of Senator Leverett Saltonstall, Regent of the Smithsonian, gave a handsome family carriage made by Thomas Goddard of Boston in 1851; included with the gift was a grant for its restoration.

Mrs. Clara W. Berwick made several gifts, one of 176 pieces of early American glass; Mrs. George Hewitt Myers gave 48 pieces of rare Castleford porcelain of 1790-1820. Arthur E. Wullschleger discovered a French hand-and-foot treadle loom of the 18th century equipped with a Jacquard mechanism of the early 19th century, which he restored and presented to the Smithsonian.

Joseph J. Fénykövi donated an African elephant of record size. Mrs. John Logan (the former Mrs. Rebecca Pollard Guggenheim) presented a 423-carat sapphire. Ralph E. Becker gave many outstanding objects from his collection of political campaign materials, including a painted banner celebrating the victory of Thomas Jefferson in 1801.

Through the foresight of Dr. Robert V. Fleming, Regent of the Smithsonian, the Southern Railway Co. preserved and presented a fine example of a late steam locomotive which has been installed in the new Museum of History and Technology.

The Revolutionary War gunboat *Philadelphia*, complete with its cannons and 700 pieces of military equipment found in it, was acquired from the estate of the late Col. Lorenzo F. Hagglund, who expressed in his will the hope that it be preserved in the National Museum. Also acquired was the unmatched W. Stokes Kirk collection of 3,000 items of military insignia and accouterments.

Dr. W. L. Libby presented the experimental equipment he used in developing the carbon-14 method of dating archeological objects. The Bell Telephone Laboratories gave 66 pieces of early telephone equipment for the telephone exhibit gallery presented by the Bell System and the independent telephone industry. Gifts of the American Telephone & Telegraph Co. include the duplicate Telstar communications satellite. The original equipment of the Nobel prize winners Drs. T. D. Lee and C. N. Yang employed in their nonparity nuclear experiments was collected for preservation, as was the electronic digital computer "Maniac," the gift of Princeton University.

During the period a number of administrative developments strengthened the work of the United States National Museum. By act of Congress a National Armed Forces Museum Advisory Board has been established. The volunteer unpaid Junior League Docent Service and the Smithsonian Museum Service have both been established to provide better educational work for schoolchildren at the Smithsonian. The installation of an Audio-Guide system in many exhibition halls has given information about the collections that appeals to the ear to supplement the labels intended for the eye.

International Exchange Service, 1953-63

The International Exchange Service is one of the oldest units of the Smithsonian. Its work, originated and organized by the first and great Secretary of the Smithsonian, Joseph Henry, more than a century ago, is specifically authorized in 49 international treaties and conventions.

During the decade under considerations, the International Exchange Service received for transmission more publications than in

any like period of its long history. There were 12,704,583 publications weighing 9,228,617 pounds received for forwarding through the Service.

The increased workload was handled at little or no additional increase in cost and with no additional employees. The use of cardboard cartons in place of wooden boxes for packing publications for oversea shipments has resulted in a large saving.

Direct booking of ocean freight shipments with the steamship lines, instead of through forwarding agents, has resulted not only in a large saving of the fees that would have been charged by the forwarding agents for their services but also in a more efficient operation. Three weeks or more were necessary under the old system of booking between packing and the shipping of the publications to the steamship piers. Publications are now packed, booked, and shipped in a period of 1 day to 1 week. This method of transmission has reduced the amount of space necessary for storage of cartons of publications awaiting shipment to the steamship lines and has speeded up the turnover of publications on hand for shipment.

A new method of processing publications for mailing has resulted in a faster transmission to the intended addressees. The old method of processing required a period of from 1 to 2 weeks before mailing. The new method provides for mailing on the day of receipt or the following day.

Bureau of American Ethnology, 1953-63

During the decade 1953-63 the activities of the Bureau of American Ethnology were concerned principally with expeditions and researches in the field and publication of anthropological monographs. This unit of the Smithsonian, founded by the great Major John Wesley Powell, is possibly the first center in the country, or even in the world, for research in cultural anthropology. Its publications are famous wherever anthropology is studied.

Of particular significance in the decade under review is the program in archeology carried on in the extreme northern part of the continent. In the earlier years of the period, archeological excavations were conducted at Cornwallis Island in the Canadian Arctic, the work being sponsored jointly by the Smithsonian Institution and the National Museum of Canada. In the Hudson Bay area, investigations on Southampton and Coats Islands occupied several seasons, a cooperative project of the Smithsonian Institution, the National Museum of Canada, and the National Geographic Society. Subsequently the American Philosophical Society joined in the financial sponsorship of those activities and attention was turned to Walrus Island. The extensive materials collected from the various islands

greatly increased knowledge about the various peoples who have lived there over a long period of time. Articles about the results and significance of the studies were published by the Smithsonian and in professional journals.

An extensive program of archeological research was carried on at the important Olmec site of La Venta, Tabasco, Mexico. This was a cooperative project in which the Smithsonian Institution, the National Geographic Society, and the University of California participated. The results obtained at La Venta, published as a bulletin of the Bureau, contribute significantly to a proper understanding of the place the Olmecs occupied in the cultural development of early America.

During this decade excavations at Russell Cave in Alabama were sponsored by the Smithsonian Institution and financed by the National Geographic Society. Russell Cave is important because of the long sequence of cultural deposits it contains, and the materials from it make possible the reconstruction of aboriginal developments over a period extending back about 9,000 years. Evidences for many cultural traits not previously recognized in the American South came to light during the course of the digging. The National Geographic Society subsequently purchased the cave and presented it to the National Park Service to be established as a national historic site.

During the 10-year period the work of the River Basin Surveys progressed in a rewarding manner. During that time 23 reservoir areas were surveyed and archeological excavations were conducted in 324 sites. The funds for the program, transferred to the Smithsonian from other government agencies and private donors, were greatly increased during the last 3 years of the decade, making it possible to expand and speed up the salvage operations. Thirty-two papers reporting on the investigations and their significance were published during the period. Others are currently in press. The information thus far obtained has added tremendously to our knowledge of the aboriginal Americans.

The archives of the Bureau, constituting a great national scientific research tool, have increased notably in size and diversity of material in this decade. Large collections of Indian photographs have been made available, and either the original negatives or copies have been added to the files. Included are 312 glass negatives of individual and group portraits of Indian delegates to Washington during the period 1874-90. The papers of Alice Cunningham Fletcher and her adopted son, Francis La Flesche, both of whom had been members of the Bureau staff in earlier years, were donated to the archives by Mrs. G. David Pearlman of Washington, D.C., in memory of her husband. The collection, filling 36 manuscript boxes, includes correspondence

and other personal papers of both Miss Fletcher and La Flesche and also extensive ethnographic items relating to the Omaha, Osage, Pawnee, Dakota, and Nez Perce Tribes, with smaller amounts on the Winnebago, the Indians of Alaska, and a few other North American tribes. Much of this material has not been published and is a fruitful source of data for students investigating those groups. Another significant addition to the archives consists of papers of Dr. Frans M. Olbrechts relating to his studies of the Cherokee Indians of North Carolina in 1926-31, when he was a collaborator of the Bureau. Dr. Olbrechts was associated with the Kominklijh Museum, Tervuren, Belgium, and following his death, Mrs. Olbrechts sent all his field notes and other pertinent data to the Bureau.

A noteworthy event in the latter part of the 10-year period was the appointment of a librarian and the reopening of the Bureau library, with its extensive collection of reference works and documentary records concerning all aspects of the life of the American Indian.

The Bureau issued several important bulletins during the period. One of the most noteworthy is "Isleta Paintings," a book outstanding both as a contribution to ethnology and as an excellent example of the effective use of good color reproductions for scholarly reasons.

National Zoological Park, 1953-63

The National Zoological Park was founded as the result of the efforts of the third Secretary of the Smithsonian, Dr. Samuel Pierpont Langley, about 75 years ago. It was established by an act of Congress and assigned to the Smithsonian Institution. Previously a number of great American animals, such as bison, were kept in pens near the original Smithsonian Building. During the years since its establishment, the Park has grown to become one of the world's great animal collections, as well as one of the most visited zoological parks in the world. In 1961 the Congress of the United States authorized the Federal Government to make appropriations to the Smithsonian Institution for capital improvements at the National Zoological Park. As a result, funds have been provided for a master plan for the modernization of the Zoo. This project, planned to be completed in 1972, will be carried out gradually so that there will be very little inconvenience to visitors or disruption of normal activities. One example of the additions made possible by this new program is the constructing of an aviary, 70 feet high and 120 feet in diameter, now nearing completion.

Gifts of animals have been numerous during this decade. Among them were a pair of Barbary apes from Sir Gordon MacMillan of MacMillan, Governor and Commander-in-Chief of Gibraltar; three East Indian monitor lizards from Hon. Carlton Skinner, Governor of

Guam; a tuatara from the Government of New Zealand; two Philippine macaques, early pioneers in space from the U.S. Air Force; two Korean bears from President Syngman Rhee of Korea; pronghorn antelopes from both the Wyoming and the Montana State Fish and Game Commissions; a pair of gorillas from Russell Arundel of Warrenton, Va.; emperor and Adelie penguins from Hon. Charles Thomas, Secretary of the Navy; a young Bengal tiger from the Ambassador of Pakistan, Syed Amjad Ali; a pair of okapis from the Government of the Belgian Congo; an African forest elephant from the Community of French Republics; two dorcas gazelles from President Habib Bourguiba of Tunisia; a spotted leopard and a male pygmy hippopotamus from President William V. S. Tubman of Liberia; an Indian rhinoceros from the Forestry Service of Assam; two Bengal tigers from Ralph Scott of Washington and Miami Beach; the beautiful white tigress "Mohini," from the Metropolitan Broadcasting Corp., the first to be seen outside of Rewa, India; "Ambika," an Indian elephant, from the "Share Your Birthday Foundation" and the Maharajah of Mysore; six North African cranes from President Ibrahim Abboud of Tunisia; three tree kangaroos from Sir Edward Hallstrom of Sydney, Australia; and a sea-lion from Attorney General Robert Kennedy.

The Zoo continued to be fortunate in its breeding program. Among the interesting births, the first in importance was that of "Tomoka," a male lowland gorilla, on September 9, 1961. Other noteworthy births were those of giraffes, pygmy hippos, gaur, Nile hippopotamus, eland, snow leopard, wisent, Cape hunting dogs, striped hyena, margay and serval cats, ring-tailed lemur, and lesser pandas. The kookaburras have laid eggs and successfully reared the young for the past 2 years, and the Surinam toads laid eggs and hatched them in their peculiar manner twice during the 10-year period.

Purchases of unusual interest were a pair of cheetahs; two flat-tailed Brazilian otters (the first to be exhibited in the United States); a pair of black rhinoceroses and a pair of the much rarer white rhinos (these also were the first to come to the States); two giant armadillos; two Père David deer, the rare fossa from Madagascar; a pair of wisent, or European bison; a trio of Saiga antelope; two Sumatran orangutans; a pair of snow leopards; a trio of Masai giraffes; three Cape buffalo; three brindled gnus; Dall sheep; Pallas's cats; maned wolves; two yaks; a Colombian red-eyed cowbird that had not been seen for so many years it was supposed to be extinct; pygmy teal; crocodile birds; and two king cobras. Scientific work, necessary to the maintenance of the great animal collection at the National Zoological Park and also important in adding knowledge concerning the con-

servation of animals, has also been carried on with increasing success during this 10-year period at the Zoo.

Astrophysical Observatory, 1953-63

During the decade ending in 1963 the Smithsonian Astrophysical Observatory experienced greater change and generated more scientific data than in any other comparable period since its establishment in 1890. In the decade the staff has increased to over 300 members. Its publications include 130 special scientific reports, plus 7 volumes of a new scientific series, Smithsonian Contributions to Astrophysics.

At the beginning of the decade the Observatory maintained two high-altitude stations for solar observations: the resultant data were used to determine the solar constant and to relate it to atmospheric phenomena. This important groundbreaking study was discontinued in 1962 because the method had reached the limit of usefulness.

When Loyal B. Aldrich retired as Director in 1955, Dr. Fred L. Whipple was appointed his successor, and in fulfillment of an arrangement with Harvard University the Observatory was moved to Cambridge, Mass., where it has gained much from close association with the large number of scientific research workers in that area.

The following year the Observatory received, through the Smithsonian Institution in Washington, the first of a series of grants from the National Academy of Sciences and the National Science Foundation for the optical tracking of artificial earth satellites to be launched during the International Geophysical Year. At the end of the IGY in 1959, the resultant tracking program of the Observatory continued under a grant from the National Aeronautics and Space Administration. The tracking camera was designed to achieve a position accuracy of 1 second of arc, and a time accuracy of 1 millisecond in photographing satellites. In addition, there were organized a Moonwatch program of amateur astronomers to make preliminary observations of satellites, a computations division to prepare orbital predictions and ephemerides, and a communications network to tie together the tracking headquarters in Cambridge with the camera stations, the volunteer Moonwatch teams, and other Government agencies.

When Sputnik I was launched on October 4, 1957, the first camera had been completed, the Moonwatch teams were ready to begin visual observing immediately, and orbital calculations and predictions commenced. In the next 9 months 12 Baker-Nunn cameras were completed and shipped to stations established by the Smithsonian Observatory in Japan, Australia, South Africa, India, Iran, Spain, Peru, Argentina, and the Netherlands West Indies, as well as in Florida, New Mexico, and Hawaii.

By the end of the decade the Moonwatch teams had made more than 53,000 observations of 191 different satellites and the cameras 81,750

observations of 73 satellites. The photoreduction division had determined more than 54,000 precise satellite positions reduced to atomic time. Meanwhile, the Observatory had evolved a number of computer programs to process observational data, prepare predictions of satellite passages, and provide the means of analyzing atmospheric densities and temperatures, solar radiation, the shape of the earth and similar phenomena.

The research and analysis division of the Smithsonian unit has produced some of the major scientific results of the U.S. space program, including determinations of the coefficients of spherical harmonics for the earth's gravitational potential, improved geodetic data, a theory of the critical inclination of satellite motion, and, from extremely accurate studies of atmospheric drag, determination of density and temperature in the high atmosphere as a function of time of day, and geographical position and solar activity.

The space science of the Observatory has extended beyond satellite tracking. Project Telescope, as a part of NASA's orbiting astronomical observatory, is now being developed to make an ultraviolet survey of the entire celestial sphere. An experiment on board one of NASA's orbiting solar observatories to study solar phenomena is being readied.

A network of automatic camera stations will make simultaneous observations of meteors over an area of a million square kilometers. This advanced program will provide the basis for a scientific project of collecting meteorites and give vital new data for detailed study of hypervelocity entry, meteoritic physics, and the upper atmosphere.

At the Observatory the first measurements were made of the radioactive isotopes, argon of atomic mass 37 and 39, produced by cosmic rays on meteorites in space. These measurements contributed to the determination of erosion rates of meteoritic materials of various kinds in space. Radiochemical analyses of recovered satellite materials first proved that solar flares introduce tritium into such material in space as well as producing transmutations of elements. The Observatory participated in a program showing that optical flare stars are also variable in the radio region of the spectrum.

Other research at the Smithsonian Observatory in the decade included analyses of sophisticated problems in celestial mechanics; precision linking of the several geodetic networks of the earth; experiments involving the origins of life and the possibilities of the extra-terrestrial organisms; studies of comets, meteors, and interplanetary dust; new methods, theories, and conclusions relating to stellar atmospheres and stellar pulsation; and other astrophysical problems.

The Division of Radiation and Organisms is a special unit of the Smithsonian Astrophysical Observatory. Research in this unit during the past 10 years has been directed principally toward solving prob-

lems in radiation biology, with specific emphasis on elaborating the intracellular mechanisms involved in regulatory responses of biological systems controlled by ionizing or nonionizing radiation.

Emphasis has been centered on the precise determination of the initial processes involved in a number of diverse light-regulated responses. In this division were determined the most precise and detailed action spectra that have been reported for photomorphogenic responses, such as bean hypocotyl hook opening, photoreversal of this response, seed germination, interaction of visible light with X-ray-induced chromosome aberrations, and the phototropic response of oat seedlings in the blue and near-ultraviolet spectral regions. From such action spectra, a great deal of significant information has been obtained about the primary photoreceptors responsible for the absorption and transfer of radiant energy in biological systems.

Kinetic studies have been carried out determining the time course of sensitivity, temperature-dependence of secondary dark reactions, the interaction of photomimetic substances, auxins and antiauxins, with the light-sensitive mechanisms. Descriptions have been deduced for some of the physical factors in plant reactions, including optical and mechanical properties of cells. The morphological development of chloroplasts after irradiation has been examined and measured, using cytochemical techniques.

Investigations have been focused on the intracellular biochemical mechanisms regulated or altered by radiation. These efforts have resulted in a number of published articles on chlorophyll synthesis, the effects of ionizing radiation on chlorophyll synthesis, and the activity and concentrations of various subcellular components isolated after irradiation, such as high energy phosphate compounds, mitochondrial activity, protein synthesis in the photosynthetic apparatus, pigment synthesis, carbohydrate metabolism, and various other enzymatic activities.

During the past several years, the division staff and facilities have expanded in order to approach radiobiological problems with a wider range of disciplines employing the most advanced techniques of biochemistry, biophysics, cytology, and plant physiology. A temperature-regulated greenhouse with controlled environment rooms has been constructed with funds provided by a nonpublic foundation, the Research Corporation. The growth of plants under natural and artificial light conditions has been measured with great accuracy. Concurrently, the construction and acquisition of specialized automatic equipment for measuring the spectral distribution of total sky light at frequent intervals have been completed, and long-term correlations of daily and seasonal fluctuations with observed plant responses are being made.

A carbon-dating laboratory has been operating in this unit of the Smithsonian for about a year, dating samples of archeological interest and initiating a research program aimed at developing new dating technics for geological samples.

Two years ago a section was incorporated for research in marine biology. This work in pure science has been financed by special gifts from a non-Federal source, the Bredin Foundation. Marine organisms are well suited to fundamental investigation of radiation responses. Studies have been initiated to identify high molecular weight phosphate compounds and determine the metabolic role of these compounds in the conversion of radiant energy to chemical energy.

Electronic and instrument shop facilities are maintained for the design, construction, and service of the complex and highly specialized instrumentation necessary to research program of the sort mentioned above.

The division has published widely and it is safe to say has achieved a favorable international reputation in radiation biology in the areas of techniques for the generation, control, and measurements of radiation; kinetics and biochemistry of photoresponses; action spectra; and solar radiation measurements. Several foreign scientists have come to the division to study its methods for 1- or 2-year periods, and work has been done in collaboration with other laboratories utilizing our specialized facilities.

National Collection of Fine Arts, 1953-63

The original act establishing the Smithsonian Institution directed that it maintain a gallery of art. The National Collection of Fine Arts, as a bureau of the Smithsonian, is the oldest gallery of art directly related to the U.S. Government.

In the decade under consideration many notable paintings, largely by distinguished American artists, have been added to the national collections under the care of the National Collection of Fine Arts, and restoration of many works of art in the collection of this bureau has been carried on.

In the first year of the present decade the exhibits of the National Collection of Fine Arts were reorganized and a main hall was opened in the Natural History Building. During the years that have followed, many temporary exhibits of importance have been shown in the foyer gallery in the Natural History Building, and under the direction of the Traveling Exhibition Service of the National Collection of Fine Arts, 375 shows, mainly in the field of the fine arts, have

been organized and circulated in over 500 different museums throughout America, as well as in museums in many foreign countries. Almost 4,500 showings have been made possible in this period by this service.

The greatest event in the decade 1953-63 was the act passed by Congress in 1958 authorizing the transfer to the Smithsonian Institution of the historic and beautiful old Patent Office Building for conversion to art galleries. Plans are well underway for the establishment in this building of public galleries, study rooms, and restoration laboratories that will allow the National Collection of Fine Arts to display its great collections of American and other paintings in a manner that could never have been achieved in its present borrowed and incongruous space in the Natural History Building of the Smithsonian Institution.

Freer Gallery of Art, 1953-63

The period 1953-63 is the fourth decade in the history of the Freer Gallery of Art. This unit of the Smithsonian Institution was established by the late Charles Lang Freer as a gallery for the display of great collections of art and as a center for the study especially of the art of the Far East and the Middle East.

The annual attendance of the Gallery during the decade has grown from approximately 70,000 to 183,000 per year. The collections have also developed in notable ways. Additions to the collections, as provided in Mr. Freer's will and purchased with the income from his bequest, have included over 450 major objects of art. The most significant of these additions have been in the fields of Ming porcelains and in Japanese painting. Mrs. Eugene Meyer, the one survivor of the three persons permitted by Mr. Freer's will to make gifts to the collection, generously has given in this period three Chinese bronzes and one Chinese painting. Members of the professional staff of the Freer during the decade have published research on the collections in 16 books and over 100 articles.

The Freer Gallery has continued during this decade its world-famous studies of the scientific composition of metallic, ceramic, and other objects of art, and the development of new preservation techniques. The Gallery during these years has been the base for the publication, under the auspices of the International Institute for Conservation of Historic and Artistic Works, of the *I.I.C. Abstracts* (commonly called the *Freer Abstracts*). The current number of this journal shows that almost 4,000 abstracts of published works on conservation have so far been made available to the whole museum world through this medium.

National Gallery of Art, 1953-63

The National Gallery of Art resulted from Andrew W. Mellon's munificent gift to the American people of his great collection of art and a splendid building in which to house it.

Although a bureau of the Smithsonian Institution, the Gallery is largely under the direction of a separate Board of Trustees of which the Secretary of the Smithsonian is an *ex officio* member.

In the decade under consideration, 4,220 works of art were acquired by the Gallery, including outstanding gifts from the Samuel H. Kress Foundation, Horace Havemeyer, William Nelson Cromwell, Syma Busiel, the Fuller Foundation, Inc., Mrs. Mellon Bruce, Mrs. P. H. B. Frelinghuysen, and many others.

During the period 45 temporary loan exhibitions were held and the annual series of lectures (A. W. Mellon Lectures in the Fine Arts) was delivered. These lectures are in the process of being published in a notable series. Many articles and books by staff members have also been published during this time.

The annual number of visitors to the National Gallery of Art has more than doubled in the past 10 years, with an attendance of 1,793,500 in fiscal year 1963 compared with 887,213 in fiscal year 1954.

Funds appropriated by Congress for maintenance of the Gallery have increased from \$1,274,473 in fiscal year 1954 to \$2,100,769 for fiscal year 1964.

National Air Museum, 1953-63

This bureau of the Smithsonian Institution has made significant progress during the decade 1953-63.

One measure of this progress is the increase in public interest in the small exhibit (less than 5 percent of its collection) which the Air Museum now has on display. For example, its old Aircraft Building, now called the Air and Space Building (a small metal building erected in 1917 as a test center for Liberty motors), had a visitor count of 237,446 in fiscal year 1953. In fiscal year 1963 the count was 2,673,618.

The greatest need of the National Air Museum has been for a suitable building in which to display its great collection of the history of manmade flight. Progress has been made toward achieving this objective. In 1958 the Congress authorized the preparation of plans and specifications for a new National Air Museum Building and designated a beautiful Mall site for it. In 1963 planning funds were appropriated by the Congress and planning will now begin.

Very important progress has been made during the decade in the techniques of storage, preservation, and restoration. In 1953 most of the collection of historic aircraft, engines, and other aeronautical materials were stored in an Air Force hangar at Park Ridge, Ill.

Space requirements of the Air Force made it necessary to move the collection. An area at Silver Hill, Md., close to Washington, was acquired by transfer, and temporary storage buildings were erected. The transfer of storage was completed in 1956.

One of the buildings at Silver Hill was constituted as a restoration and preservation facility. With the congressional authorization of the new National Air Museum Building in 1958, this work was accelerated, and creditable shop facilities have been established, together with the completion of connecting roadways between storage buildings and shop. By the end of the decade under consideration, this facility was engaged in the restoration and preservation of historic aircraft and engines in anticipation of the increased display requirements of the new Air Museum Building.

The decade marked a very large increase in the collection of the Museum. A total of 3,424 historic specimens were added, including many full-size aircraft and, during the recent years, spacecraft. Notable among these accessions were: a Douglas DC airplane, No. 164; the "Excalibur" airplane which made the first nonstop solo flight over the North Pole; a Boeing 247-D airplane; a 1929 Link Trainer; a Pitcairn Autogyro of 1929; the "Ole Miss" Curtiss airplane; a "Vanguard" launch vehicle; a Verville-Sperry "Messenger" airplane of 1920; a bronze statue of Brig. Gen. William Mitchell; the "First Recovered Nose Cone" from space; a "Jupiter C" launch vehicle; a collection of original records and memorabilia of Dr. Robert H. Goddard, given by Mrs. Robert H. Goddard; an original holograph manuscript of "Soaring Flight" by John J. Montgomery; a Ryan X-13 "Vertijet" airplane; the Lockheed "Sirius" airplane flown by Charles A. and Anne Morrow Lindbergh; an "Atlas" launch vehicle; the "Able-Baker" spacecraft; a McDonnell FH-1 "Phantom" carrier-based aircraft; the first "space" camera; the "Que Sera Sera," first airplane to land at the South Pole; "Freedom 7," America's first manned spacecraft; the "Sacred Cow," a Douglas C-54, the first Presidential airplane; an early Bellanca airplane; an original oil portrait of Gen. Claire Chennault and a number of his medals; a "Polaris" rocket; "Friendship 7," America's first manned orbital spacecraft; gear worn and used by Astronaut John Glenn on his historic flight in "Friendship 7"; and an original painting of Astronaut Alan B. Shepard, Jr., by artist James Scalse from the Honorable James G. Fulton.

One of the most important areas of progress during the past 10 years has been the increase in the study library and reference files. This collection now numbers more than 12,000 books, more than 300 file cabinets of reference material, and approximately 100,000 photographs.

The research work of the Museum has increased along with the increase in public interest in its exhibits. Most of the time of the professional staff is taken up with historical, technical, and biographical research to provide a service to authors, publishers, historians, engineers, teachers, and students seeking authentic information.

In addition, a considerable increase in historical and technical research is required in connection with the accelerated restoration program of aircraft and engines.

For the National Air Museum the decade has been a transition period. It has changed from a collecting and storing agency to a full museum operation that is commensurate with its world-renowned collection and its responsibilities to the public. It has developed new displays, research, studies, preservation and restoration techniques, and publications in a field of great American patriotic and historical interest—manmade flight.

National Portrait Gallery, 1961-63

In 1961 Congress provided for the establishment of the National Portrait Gallery. This gallery will be housed, together with the National Collection of Fine Arts, in the old Patent Office Building which, as noted above, has been transferred to the Smithsonian Institution.

The Congress in 1962 provided for the establishment of a National Portrait Gallery Commission to advise the Smithsonian Institution in organizing and developing this new and important unit.

National Cultural Center, 1958-63

The National Cultural Center was established by an act of Congress in 1958, and the new unit was designated as a bureau of the Smithsonian Institution. Like the National Gallery of Art, the National Cultural Center is largely administered by its own special Board of Trustees.

Since the establishment of the bureau the principal function has been connected with raising the funds to erect a suitable building in the Nation's Capital to provide halls for the presentation of opera, symphonic concerts, dramatic performances, ballet, and other fields of the performing arts.

Financial Resources, 1953-63

During the decade many generous gifts of funds have come to the Smithsonian from private individuals and from foundations. Most of these gifts are for very specific purposes. The most notable of these private benefactions is the receipt of a legacy which, when finally settled, will be in excess of \$11½ million from the late Robert Lee Forrest. Another important benefaction came from the estate of

Atherton Seidell. Laura D. Barney has also been most generous to the Institution during this period, and she and her sister, Natalie C. Barney, gave the Smithsonian the Barney Studio House in Washington.

At the beginning of this period (June 30, 1952) the book value of the unexpended funds and endowments of the Smithsonian was \$11,138,392. As indicated in the financial statement on a later page of this report, this sum has now reached a total of \$22,534,920. The market value of the securities and assets of the endowment funds of the Smithsonian at the end of the period is in excess of \$25,000,000. The income from the many funds that make up this total is expended according to the directions of the donors of the funds.

During the decade Federal funds for building and for planning buildings have been provided to the Smithsonian to a total of \$61,012,000. At the beginning of the period the annual appropriation for the basic expenses of the operation of all the bureaus of the Smithsonian Institution (except the National Gallery of Art and the National Zoological Park, which have separate budgets) was \$2,553,200. The appropriation for these same parts of the Institution for the fiscal year 1964 is \$13,124,000. At the start of the decade the annual operating appropriation for the National Zoological Park was \$620,800. The appropriation for this part of the Institution for fiscal year 1963 was \$1,470,200. Capital appropriations for the National Zoological Park in this period, in addition to operating funds, have been \$2,550,000. The budget of the National Gallery of Art, which is administered separately from the Smithsonian Institution as a whole, was \$1,240,000 at the start of the decade, and the appropriation for 1964 for this unit was \$2,138,000. Gifts and grants for research projects and other specific purposes, exclusive of appropriated funds and all for the particular purposes specified by donors or grantors, have totaled \$32,489,471 in the decade under consideration.

It can be said with assurance, as the progress of the decade 1953-63 is reviewed, that the Smithsonian's donor, James Smithson, planned well when he directed that his Institution should concern itself with the great and related humanitarian functions of *the increase and the diffusion of knowledge among men*.

THE ESTABLISHMENT

The Smithsonian Institution was created by act of Congress in 1846, in accordance with the terms of the will of James Smithson, of England, who in 1826 bequeathed his property to the United States of America "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." In receiving the property and accepting the

trust, Congress determined that the Federal Government was without authority to administer the trust directly, and, therefore, constituted an "establishment," whose statutory members are "the President, the Vice President, the Chief Justice, and the heads of the executive departments."

THE BOARD OF REGENTS

The appointment to the vacancy in the class of citizen regent was effected by the approval on July 2, 1963, of a joint resolution of Congress designating Dr. William A. M. Burden of New York to succeed the late Dr. Arthur H. Compton as a Regent for the statutory term of 6 years.

The roll of Regents at the close of the fiscal year was as follows: Chief Justice of the United States Earl Warren, Chancellor; Vice President Lyndon B. Johnson; members from the Senate: Clinton P. Anderson, J. William Fulbright, Leverett Saltonstall; members from the House of Representatives: Frank T. Bow, Clarence Cannon, Michael J. Kirwan; citizen members: John Nicholas Brown, William A. M. Burden, Robert V. Fleming, Crawford H. Greenewalt, Caryl P. Haskins, and Jerome C. Hunsaker.

The customary informal dinner meeting, preceding the annual meeting, was held in the Great Hall of the Smithsonian Building on January 23, 1963. Exhibits showing some of the recent work of the Smithsonian bureaus were in place in the hall at the time of the dinner to apprise the Regents of current Smithsonian research developments. Dr. Richard S. Cowan spoke on "Research for a Tropical American Rain-Forest Exhibit"; Dr. Robert P. Multhauf on "History of the Measurement of Gravity in the 19th Century"; Dr. John A. Pope on "The Freer Gallery of Art Research Project on Ancient Chinese Ceremonial Bronzes"; and Dr. Fred L. Whipple on "Scientific Study of Recovered Parts of Russian Sputnik IV."

The annual meeting was held on January 24, 1963. The Secretary presented his published annual report on the activities of the Institution. The Chairman of the Executive and Permanent Committees of the Board, Dr. Robert V. Fleming, gave the financial report for the fiscal year ended June 30, 1962.

The spring meeting of the Board of Regents was held at 5 o'clock in the Regents Room. A financial report was presented by the chairman of the Executive Committee. The Regents then adjourned to the hall of fossil mammals for an informal dinner.

RETIREMENT OF DR. KELLOGG

On October 31, 1962, Dr. A. Remington Kellogg, Assistant Secretary of the Smithsonian Institution and Director of the United States National Museum, retired and assumed the status of honorary re-

search associate of the Smithsonian. During Dr. Kellogg's service as Director, beginning in 1948, the National Museum experienced a remarkable growth. The collections grew from 25 million specimens in 1948 to 56 million in 1962. A renovation of exhibits programs revitalized more than 20 exhibition halls in the National Museum. A wing was added to the Natural History Museum, and a new Museum of History and Technology was built. Dr. Kellogg directed the programs that resulted in these achievements and participated strongly in their execution.

Prior to becoming Director of the National Museum, Dr. Kellogg had served in the division of mammals, beginning in 1928 as assistant curator and becoming curator of the division in 1941. His main scientific interest has been, and continues to be, the biology of whales, in which field he is one of the world's foremost authorities. His research on the paleontology of whales has been widely acclaimed. It is altogether fitting, therefore, that he should now be conducting his scientific investigations in a workroom on the vertebrate paleontology floor of the museum wing which he helped to create. He is continuing to publish his excellent scientific reports.

On November 1, 1962, following Dr. Kellogg's retirement, Dr. Albert C. Smith, who had been Director of the Museum of Natural History since 1958, became an Assistant Secretary of the Institution.

NATIONAL PORTRAIT GALLERY

On April 27, 1962, Public Law 87-443 established the National Portrait Gallery as a bureau of the Smithsonian Institution to "function as a free public museum for the exhibition and study of portraiture and statuary depicting men and women who have made significant contributions to the history, development, and culture of the people of the United States and of the artists who created such portraiture and statuary."

This act of Congress also authorized the establishment of a National Portrait Gallery Commission, to serve as an advisory body to the Board of Regents in regard to programs, methods of operation, and selections of appropriate displays for the new Gallery. The members of the Commission, as announced on June 21, 1963, by the Chancellor of the Board of Regents, the Honorable Earl Warren, are as follows:

Catherine Drinker Bowen, author and historian, of Bryn Mawr, Pa.

Julian P. Boyd, author and historian, of Princeton, N.J.

John Nicholas Brown, Regent of the Smithsonian Institution, of Providence, R.I.

Lewis Deschler, Parliamentarian of the House of Representatives of the United States Congress, of Bethesda, Md.

David E. Finley, former Director of the National Gallery of Art, of Washington, D.C.

Wilmarth Sheldon Lewis, historian and biographer, of Farmington, Conn.

Richard H. Shryock, author and historian, of Philadelphia, Pa.
 Col. Frederick P. Todd, Director of the U.S. Military Academy Museum, of West Point, N.Y.

Ex officio:

The Chief Justice of the United States.
 The Secretary of the Smithsonian Institution.
 The Director of the National Gallery of Art.

NATIONAL ARMED FORCES MUSEUM ADVISORY BOARD

Public Law 87-186 (August 30, 1961) established a National Armed Forces Museum Advisory Board in the Smithsonian Institution to provide advice and assistance to the Smithsonian Board of Regents on matters concerning the portrayal of the contributions which the Armed Forces of the United States have made to American society and culture, the investigation and survey of lands and buildings in and near the District of Columbia suitable for the display of military collections, and the preparation of recommendations to the Congress with respect to the acquisition of lands and buildings for such purposes.

This law additionally provides that the Smithsonian Institution shall (1) commemorate and display the contributions made by the military forces of the Nation toward creating, developing, and maintaining a free, peaceful, and independent society and culture in this country; (2) portray the valor and sacrificial service of the men and women of the Armed Forces as an inspiration to the present and future generations of America; (3) demonstrate the demands placed upon the full energies of our people, the hardships endured, and the sacrifice demanded in our constant search for world peace; (4) graphically describe the extensive peacetime contributions the Armed Forces have made to the advance of human knowledge in science, nuclear energy, polar and space exploration, electronics, engineering, aeronautics, and medicine; (5) interpret through dramatic display significant current problems affecting the Nation's security; and (6) provide a study center for scholarly research into the meaning of war, its effects on civilization, and the role of the Armed Forces in maintaining a just and lasting peace by providing a powerful deterrent to war.

Members of the National Armed Forces Museum Advisory Board will serve 6 years, except for the initial Board which was appointed by the President in April 1962 to serve for terms of 2, 4, and 6 years:

John Nicholas Brown, Regent of the Smithsonian Institution
 Rufus E. Clement, President of Atlanta University
 Fred Korth, Secretary of the Navy
 David L. Kreeger, Vice President of Government Employees Insurance Co.
 Cyrus B. Vance, Secretary of the Army
 Earl Warren, Chief Justice of the United States

Henry B. Washburn, Jr., Director of the Boston Museum of Science

William W. Whiteman, Jr., lawyer and financier, Oklahoma City

Eugene M. Zuckert, Secretary of the Air Force

The Advisory Board has held two meetings, during which it selected a chairman, John Nicholas Brown, adopted bylaws for its operation, considered the scope and extent of the Board's functions, and proposed areas of study. A number of potential Museum sites in the Greater Washington area have been considered, and several have been examined by the Advisory Board.

FINANCES

A statement on finances, dealing particularly with Smithsonian private funds, will be found in the report of the executive committee of the Board of Regents, page 253. Funds appropriated to the Institution for its regular operations for the fiscal year ended June 30, 1963, totaled \$11,060,550. Besides this direct appropriation, the Institution received funds by transfer from other Government agencies as follows: From the District of Columbia for the National Zoological Park, \$1,504,997; from the National Park Service, Department of the Interior, for the River Basin Surveys, \$271,000.

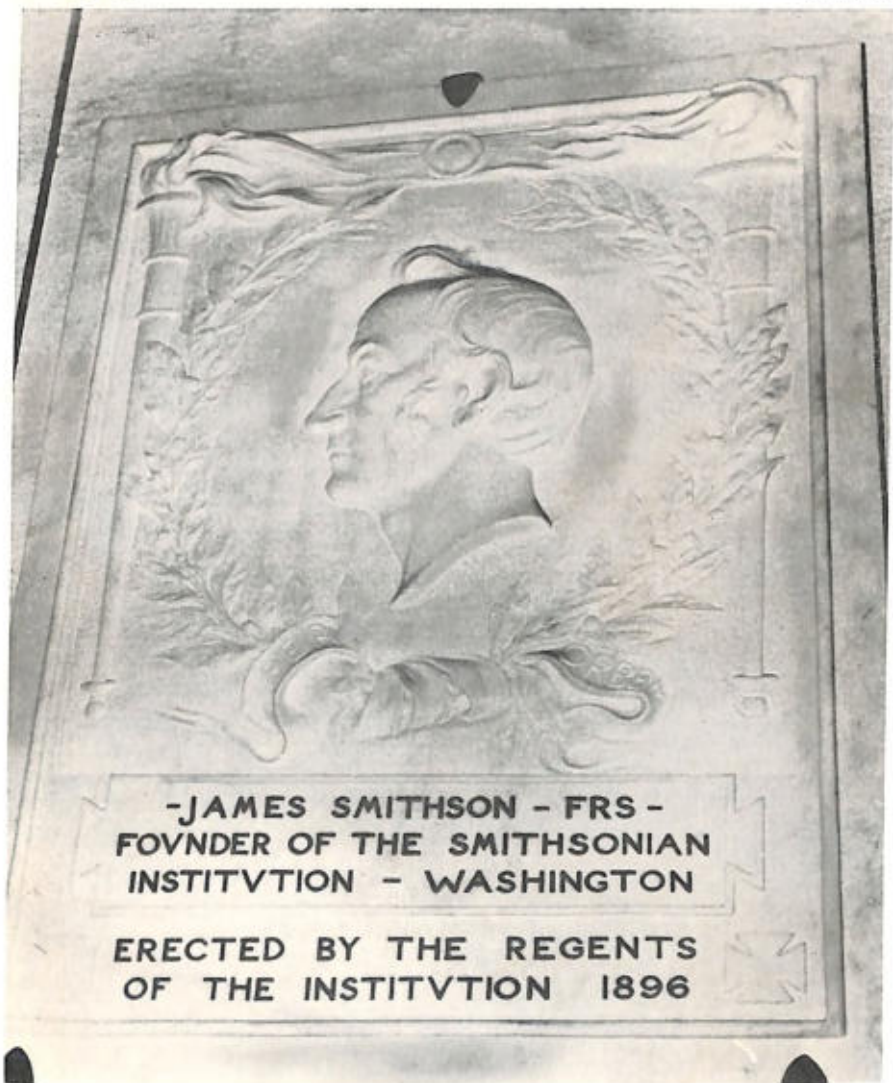
VISITORS

Visitors to the Smithsonian buildings on the Mall again surpassed all records with a total of 10,309,836, which was 1,386,705 more than for the previous year. April 1963, with 1,720,716, was the month of largest attendance; August 1962 second, with 1,616,360; July 1962 third, with 1,612,452. Table 1 gives a summary of the attendance records for the five buildings; table 2, groups of schoolchildren. A new method adopted for estimating the number of visitors at the National Zoological Park showed a total of 3,200,000 for the year. When this figure is added to the attendance in the Institution's buildings on the Mall, and to the 1,793,500 recorded at the National Gallery of Art, the total Smithsonian attendance for 1962 may be set at 15,303,336.

REPLACEMENT OF SMITHSON PLAQUE

In 1896 the Smithsonian Board of Regents caused to be erected a handsome marble memorial to James Smithson in the English Church of the Holy Ghost in Genoa, Italy, where he died on June 26, 1829. During World War II the church was gutted by fire following Allied bombardments and stripped of all fittings by looters. Following the war the church was restored, but all trace of the Smithson cenotaph had disappeared.

It seemed appropriate and desirable that this memorial to the founder of the Smithsonian Institution be replaced, and in 1960 the Board of Regents so authorized. The new plaque, sculptured by Raf-



Smithson plaque as restored in English Church of the Holy Ghost, Genoa, Italy, 1963

faello Romanelli, of Florence, is a facsimile of a replica of the original which is erected adjacent to the Smithson tomb in the Smithsonian Building in Washington. In May 1963 the Institution was notified by the American Consul General at Genoa that installation of the new memorial had been completed (pl. 1).

Thanks are due particularly to the following individuals for their interest and cooperation in helping to initiate or complete this project: John LePelley, of Paris, assistant vice president of the First National City Bank of New York; David Balfour, former British Consul General at Genoa; S. A. H. Eley, Lord Bishop of Gibraltar; F. J. Bailey, the Archbishop of Malta; Stephen P. Dorsey, American Consul General at Genoa; and to sculptor Romanelli for his faithful creation.

TABLE 1.—Visitors to certain Smithsonian buildings during the year ended June 30, 1963

Year and month	Smithsonian Building	Arts and Industries Building	Natural History Building	Air and Space Building	Freer Building	Total
<i>1962</i>						
July.....	258, 510	555, 775	267, 106	502, 686	28, 375	1, 612, 452
August.....	264, 448	595, 337	282, 016	443, 142	31, 417	1, 616, 360
September.....	79, 136	200, 639	119, 261	116, 104	14, 267	529, 407
October.....	64, 169	159, 731	120, 189	101, 711	11, 169	456, 969
November.....	55, 136	159, 100	121, 763	92, 541	10, 846	439, 386
December.....	34, 400	73, 199	70, 306	45, 726	5, 940	229, 571
<i>1963</i>						
January.....	39, 430	96, 555	114, 159	64, 642	6, 558	321, 344
February.....	51, 528	114, 532	106, 570	75, 033	7, 098	354, 761
March.....	76, 916	165, 820	154, 488	120, 853	10, 901	528, 978
April.....	298, 248	692, 693	337, 878	370, 947	20, 950	1, 720, 716
May.....	210, 378	352, 299	283, 510	325, 157	15, 574	1, 186, 918
June.....	197, 981	368, 502	311, 151	415, 076	20, 264	1, 312, 974
Total.....	1, 630, 280	3, 534, 182	2, 288, 397	2, 673, 618	183, 359	10, 309, 836

TABLE 2.—*Groups of schoolchildren visiting the Smithsonian Institution during the year ended June 30, 1963*

Year and month	Number of children	Number of groups	Year and month	Number of children	Number of groups
<i>1962</i>			<i>1963</i>		
July.....	12, 810	348	July.....	23, 808	629
August.....	6, 991	208	August.....	17, 124	493
September.....	4, 797	146	September.....	41, 888	1, 046
October.....	25, 970	698	October.....	77, 770	1, 726
November.....	32, 495	818	November.....	165, 384	3, 428
December.....	12, 946	368	December.....	53, 065	1, 174
			Total....	475, 048	11, 082

Report on the United States National Museum

SIR: I have the honor to submit the following report on the condition and operations of the U.S. National Museum for the fiscal year ended June 30, 1963:

COLLECTIONS

During the year 1,723,830 specimens were added to the national collections and distributed among the 8 departments as follows: Anthropology, 11,993; zoology, 1,361,586; botany, 69,642; geology, 80,414; science and technology, 2,588; arts and manufactures, 2,910; civil history, 191,753; and Armed Forces history, 2,944. The largest divisional acquisition was in the division of insects, which accessioned a total of 1,209,339 specimens. Most of this year's accessions were acquired as gifts from individuals or as transfers from Government departments and agencies. The complete report on the Museum, published as a separate document, includes a detailed list of the year's acquisitions, of which the more important are summarized below. Catalog entries in all departments now total 57,541,770.

Anthropology.—The division of archeology received as its largest accession a lot of 8,431 specimens from Alaska collected for the Museum by Dr. James A. Ford. His published monograph, "Eskimo Prehistory in the Vicinity of Point Barrow," made it possible to accession the specimens according to the published types and illustrations. James P. Mandaville, Jr., donated a well-documented collection of 185 specimens from northern Arabia, including potsherds, terra-cotta figurine fragments, and an inscribed copper hoe blade. Three important collections of Iranian artifacts were presented by Mr. and Mrs. Anthony Cuomo, Mr. and Mrs. Daniel F. Magner, and C. Edward Wells. Represented among the 160 specimens are pottery, bronze weapons, inscribed mud bricks, and glazed architectural fragments, ranging in dates from 2000 B.C. to the third century A.D. A group of five Korean bronze weapons of the Han Dynasty was donated by Gen. George H. Decker. A rare anthropomorphic pottery figure from the Bahía culture of the Esmeraldas region was acquired from Mrs. Erika Burt.

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Paku Alam VIII, through the American Embassy in Djakarta. The Government of Vietnam, through its embassy in Washington, D.C., presented 67 specimens comprising a carved wooden chest, bronze vessels, and textiles. For use in the preparation of new exhibits, 103 ornaments, household items, and weapons of the people of Burundi were obtained from David W. Doyle, American Vice Consul at Usumbura, Burundi. Also for exhibition, a Chinese collection of 365 specimens was acquired from Taiwan with the assistance of the National Historical Museum and the Provincial Museum, under the direction of the Ministry of Education and Academia Sinica.

The division of physical anthropology received, from the U.S. Army Research Institute of Environmental Medicine, a collection of 50,000 somatotype negatives. These were made during the U.S. Army survey of male body build in 1945-46 under the direction of E. A. Hooton and form the basis for the Harvard system of rating body build. Largest of its kind, the collection will be available for study by qualified professionals. Received for study and exhibit purposes is a new set of casts of the original Neanderthal skeleton, gift of the Rheinisches Landesmuseum, Bonn, Germany, and excellent casts of *Oreopithecus* from central Italy, received from the Natural History Museum in Basle, Switzerland. Other accessions include human skeletal materials from Mexico, Alaska, and various parts of the United States.

Zoology.—Staff members and cooperating agencies contributed approximately 9,200 specimens to the division of mammals, most of these being collected by Dr. Charles O. Handley, Jr., and Francis M. Greenwell in Panama. Others were collected by Naval Medical Research Unit No. 2, in Formosa; by Dr. Dale Osborn in Turkey; by Gary L. Ranch in Libya and Iran; by the department of microbiology of the University of Maryland, in West Pakistan and Mexico; and by Kenneth I. Lange and James H. Shaw in the Malagasy Republic. Dr. Henry W. Setzer of the Museum staff participated in the last three projects. Other valuable collections were made as follows: by Miss Alena Elbl of the University of Maryland, in Ruanda Urundi; by Dr. L. G. Clark of the University of Pennsylvania, in Nicaragua, and by William J. Schaldach, Jr., in southern Mexico. Important specimens obtained for the exhibition series include a large male walrus, collected by Hugh H. Logan, and two paratypes of the bat *Philippinopterus lanei*, presented by Dr. Edward H. Taylor.

To the collections of the division of birds, 2,259 bird skins, 1,011 anatomical specimens, and 1 egg from Panama and 198 skeletons from Kenya were received through Dr. Alexander Wetmore; 642 skins, 128 skeletons, and 9 alcoholic specimens from the U.S. Fish and Wildlife Service; 198 skins from Formosa transferred from the U.S. Department of the Navy, U.S. Naval Medical Research Unit No. 2, through

Dr. Robert E. Kuntz; and a collection of wooden game-bird calls, together with tape recordings demonstrating their use, from Dr. Augusto Ruschi, director, Museu de Biologia Prof. Mello Leitao, Brazil.

In the division of reptiles and amphibians, several additions to the collections are noteworthy: a gift of 325 Colombian frogs, including types and paratypes, from Brother Hermano Nicéforo María, Bogotá, Colombia; a gift of 162 reptiles and amphibians collected in Mexico and Central America from Elkan J. Morris, Fairbanks, Alaska; 71 reptiles and amphibians obtained for the Museum in South America and Panama by Dr. Charles O. Handley, Jr., and Francis M. Greenwell; 70 amphibians acquired for the Museum from South America and Panama by Mrs. Doris H. Blake and Dr. Doris M. Cochran; an exchange of 27 Colombian frogs with the Chicago Natural History Museum; and an exchange of 21 Brazilian frogs with Werner C. A. Bokermann, São Paulo, Brazil.

Exchanges of specimens netted the division of fishes the major portion of the current year's new accessions. Received on exchange was the holotype of a new *Dascylus* from D. Wolfgang Klausewitz, Frankfurt, Germany. Horace Loftin and Dr. R. W. Yerger sent, on exchange, 10,000 fresh-water fishes from the Canal Zone, Panama, collected by Mr. Loftin. Other contributors of holotypes include Drs. Giles W. Mead and Henry B. Bigelow, Museum of Comparative Zoology, Harvard University; Dr. George S. Myers, Stanford University; and Loren P. Woods, Chicago Natural History Museum. Among the contributors of paratypes were Dr. C. Richard Robins, University of Miami, Marine Laboratory; Dr. Norman J. Wilimovsky, University of British Columbia; Dr. Jacques R. Géry, Laboratoire Arago, France; and Dr. José Alvarez del Villar, Instituto Politécnico Nacional, Mexico.

The division of mollusks added a total of 23,967 specimens to its collections. Dr. Joseph Rosewater of the Museum staff collected 1,194 marine and land mollusks on Eniwetok Atoll. Mr. and Mrs. Delmas H. Nucker donated 699 specimens of marine mollusks from the Caroline Islands, and Dr. Tadashige Habe added 120 specimens, of which 28 are paratypes, of recently described mollusks from Japan. Holotypes of molluscan species and subspecies were received from Dr. Raul Guitart, Dr. Harry W. Wells, Messrs. Leslie Hubricht, Thomas L. McGinty, and William G. Percy, and from the U.S. Fish and Wildlife Service Laboratory, Pascagoula, Miss., through Harvey R. Bullis, Jr. A total of 1,257 helminthological specimens, among which were many types of new species, were added to the collection housed in the Parasitological Laboratory of the Animal Disease and Parasite Research Branch of the U.S. Department of Agriculture, Beltsville, Md.

The division of marine invertebrates acquired a number of important collections. Leslie Hubricht of Meridian, Miss., presented his personal collection of 32,327 fresh-water invertebrates, containing what is probably the largest and most valuable series of American fresh-water isopod crustaceans ever assembled. A total of 33,177 specimens were received from the Fourth Smithsonian-Bredin Caribbean Expedition, 1960. Through Dr. Harry S. Ladd, the Paleontology and Stratigraphy Branch of the U.S. Geological Survey contributed 1,079 corals from the Marshall Islands, including 217 type and figured specimens described by Dr. J. W. Wells in his comprehensive monograph on Indo-Pacific reef corals. Through Dr. Arthur G. Humes, Boston University donated 852 copepod and isopod crustaceans. Approximately 974 isopod and 322 amphipod crustaceans were received from the Beaudette Foundation for Biological Research, through Dr. J. Laurens Barnard. Included in this group are 198 paratypes of 4 species of isopods described by Dr. Robert J. Menzies.

The U.S. Department of Agriculture, through Dr. William H. Anderson, transferred to the division of insects the largest single accession ever received: a collection of Coccidae (scale insects) conservatively estimated to contain 1 million specimens. Additional important accessions include the Harold E. Box collection of 5,000 Neotropical cane-boring moths of the genus *Diatraea*; a donation of 8,000 North American butterflies and moths by Dr. George W. Rawson; the J. C. Hopfinger collection of butterflies and moths; 6,741 specimens, mostly Coleoptera, from William W. Pinch; 805 Brazilian insects from Dr. C. M. Biezanko; 6,543 British Columbian insects from C. Garrett; 6,612 specimens from N. L. H. Krauss, who has been a devoted contributor for many years; and 2,000 specimens from Guatemala from Dr. Thomas H. Farr.

Noteworthy contributions to the collections by staff members include 900 specimens, mostly European centipedes, from Dr. Ralph E. Crabill, Jr.; 41,110 specimens collected in Puerto Rico, Virgin Islands, and North America from Dr. Paul J. Spangler; 400 specimens of butterflies from the eastern United States from William D. Field; 1,192 miscellaneous insects, chiefly caddisflies, from Dr. Oliver S. Flint, Jr.; 7,826 specimens, mostly Microlepidoptera, from the northwestern United States from Dr. J. F. Gates Clarke; and 285 specimens, chiefly Orthoptera, from Dr. Ashley B. Gurney, U.S. Department of Agriculture. Others making important donations were Drs. Nell B. Causey, G. E. Ball, W. L. Brown, Richard L. Hoffman, and Bernard Feinstein.

Botany.—A fine lot of 4,143 herbarium specimens and 480 wood samples from Brazil, presented by Boris A. Krukoff, Smithtown, N.Y., adds appreciably to the national collections. Among them

was a group of woods from laticiferous plants on which anatomical research was planned by Mr. Krukoff. Dr. José Cuatrecasas gave 3,200 specimens which he collected in Colombia. Other gifts included 620 excellent specimens of Pennsylvania plants from Muhlenberg College, Allentown, Pa.; 850 cryptogams, mostly mosses, from Dr. F. J. Hermann, Adelphi, Md.; and 504 specimens from the University of Alaska.

Several large collections were received in exchange. A group of 845 slides of pollen of African plants was received from Duke University through Mrs. Shirlee Cavaliere and 765 slides from the Pan American Petroleum Corp. of Tulsa, Okla., through Dr. Donald W. Engelhardt. Gray Herbarium of Harvard University sent 1,037 specimens collected by Dr. L. J. Brass on the Fourth Archbold Expedition to New Guinea. Other exchanges included 845 specimens of Asia and eastern Europe from the V. L. Komarov Institute of Botany of the Academy of Sciences, Leningrad, U.S.S.R.; 888 specimens collected in Mexico by Dr. Faustino Miranda from the Instituto de Biología, Universidad Nacional de México; and 382 plants of Australia from the Commonwealth Scientific and Industrial Research Organization, Melbourne.

Dr. John J. Wurdack collected for the Museum 9,258 specimens in Peru; Dr. R. S. Cowan and Dr. Thomas R. Soderstrom, 3,370 specimens in British Guiana; and Dr. William L. Stern, 439 specimens in Oregon, Wyoming, and Colorado.

From the U.S. Geological Survey were transferred 801 specimens collected on the Pacific islands by Dr. F. R. Fosberg; from the U.S. Fish and Wildlife Service, 420 plants collected in Alaska by Frank Beals; and from the Agricultural Research Service, Department of Agriculture, 235 specimens collected in Iran and Mexico by Dr. Howard Scott Gentry.

Geology.—A total of 3,885 specimens was received in the division of mineralogy and petrology. Among the important gifts are a very fine specimen of legrandite, Mapimi, Mexico, from Bernard T. Rocca, Sr., and an exceptional specimen of fairfieldite, Kings Mountain, N.C., from Carter Hudgins. Outstanding among specimens received by exchange was a collection of cerussite, azurite, and associated minerals from Tsumeb, South West Africa; a crystal of vivianite, 31 inches in length from the Cameroons; and a fine piece of malachite, from the Congo. New species received in exchange were: calumetite, Michigan; angelellite, Argentina; arsenate-belovite, fersmanite, gerasimovkite, kupletskite, lomonossovite, and vinogradovite, from the U.S.S.R.; bafertisite, Inner Mongolia; bergenite, East Germany; bonattite, Canada; carobbiite, Italy; cuprorivaite, Italy; hydroames-

ite, Hungary; reinerite, stranskite, and gallite, South West Africa; and schuetteite and wightmanite, California.

A total of 815 specimens was added to the Roebing collection by purchase or by exchange. Among these are outstanding specimens of wulfenite, calcite, and agate from Mexico. Gem specimens include a 17-carat greenish-yellow brazilianite, from Brazil; a 30-carat cat's-eye cerussite, from South West Africa; and a 9.35-carat axinite from Baja California, Mexico. Acquired by purchase through the Canfield fund is a magnificent group of amethyst quartz crystals from Guerrero, Mexico. The largest crystal measures 4 by 18 inches, and each is tipped by white quartz.

New acquisitions to the gem collection include a 2.86-carat deep-pink diamond, Tanganyika, from S. Sydney De Young; a 235.5-carat morganite, Brazil, from Mr. and Mrs. Frank IX, Jr.; a 277.9-carat citrine, Brazil, from Albert Cutter; and a 177-carat kunzite, California, from the American Gem Society. Gem specimens acquired by purchase through the Chamberlain fund for the Issac Lea collection include a 17.5-carat pink tourmaline cat's-eye and a 4,500-carat faceted smoky quartz egg, both from California; and a 9-carat axinite, from Baja California, Mexico.

During the year 20 meteorites were added to the collection, of which 11 were not previously represented. The Bogou meteorite was of special interest. This 8.8-kilogram coarse octahedrite, which came to the Museum through the generous cooperation of the Government of Upper Volta and the U.S. Atomic Energy Commission, was observed to fall in Upper Volta on August 14, 1962. It is being extensively studied in several laboratories because observed falls of iron meteorites are extremely rare.

In the division of invertebrate paleontology and paleobotany, a number of important collections of invertebrate fossils were acquired. Among transfers of type specimens from the U.S. Geological Survey were: 68 Permian pelecypods described by K. Ciriaks of Columbia University; 369 specimens of Upper Cretaceous oysters from the western interior; 40 Permian corals from Nevada with thin sections; and 33 specimens and 87 thin sections of Middle Silurian corals from Quebec, described by W. A. Oliver, Jr.

Funds from the Walcott bequest were used to purchase the Hughes collection of Tertiary invertebrates from Florida, numbering more than 50,000 specimens. The Walcott fund also provided means for staff collections which included 4,000 Upper Cretaceous mollusks from the western interior; 5,000 Tertiary invertebrates from Hampton, Va.; and 2,000 fossil echinoids from southwestern Florida. The Springer fund made possible the purchase of 210 Triassic echinoids and 72 Paleozoic echinoids from the western United States.

Gifts from collectors outside the Smithsonian Institution include: 221 type specimens of planktonic Foraminifera from Recent bottom sediments of the Pacific Ocean from Miss Frances Parker of the Scripps Institution of Oceanography; 1,000 Upper Cretaceous mollusks from Tennessee and Mississippi arranged by Margaret J. Hall through Mid-South Earth Science Club; 6,000 Silurian brachiopods from Czechoslovakia collected by Dr. A. J. Boucot of the California Institute of Technology; 134 type specimens of Foraminifera from the Cretaceous Adelpia Marl of Arkansas from Dr. H. C. Skinner, Tulane University; 500 specimens of Middle Devonian brachiopods and corals from northern Ohio from Bernard Keith; 100 Early Devonian invertebrates from Flute Cave, W. Va., from the Potomac Speleological Club; 50 specimens of early Ordovician brachiopods from Kielce, Poland, from Dr. R. B. Neuman; 23 rare and unusual Miocene mollusks from Virginia from Mr. and Mrs. W. M. Rice; and 52 thin sections of type Foraminifera from the Mississippian of southern Illinois and Kentucky from Mrs. D. E. N. Zeller of the University of Kansas.

Outstanding specimen exchanges brought 76 specimens of Pliocene mollusks from the Scaldesian formation of Belgium, through Dr. S. Amelinckx; 99 specimens of fossil invertebrates from Argentina through Dr. A. J. Amos; 13 ammonites from the Cretaceous of Russia through Dr. D. P. Naidin; and the Harris collection of type specimens of fossil crinoids, from the University of Houston.

In the division of vertebrate paleontology, the major specimens of fossil vertebrates accessioned this year consist of two skulls and a skeleton of three different tetrapods from the Permian of Texas, and two partial skeletons of Mississippian amphibians, probably new to science, from West Virginia. The Texas material is of superior quality and will be most useful in morphological work. These specimens were collected by associate curator Nicholas Hotton III and James Kitching of the University of the Witwatersrand, Johannesburg, South Africa.

A remarkably good collection comprising remains of a variety of Eocene mammals found by W. L. Rohrer in the Big Horn Basin of Wyoming was transferred from the U.S. Geological Survey. Noteworthy are skull portions of the large pantodont *Coryphodon*, jaws and maxillae of the early horse *Hyracotherium* and the lemuroid primate *Pelycodus*, and the greater part of a skull of a rare leptictid insectivore.

Science and technology.—The division of physical sciences received from the Bell Telephone Laboratories the apparatus used by Dr. Clinton T. Davisson in his 1927 investigations of interference phenomena in crystals irradiated by electrons, for which he received

the Nobel prize in physics in 1936. Received also was a full-scale reproduction of an observational armillary, one of the large astronomical instruments used by Tycho Brache, from L. S. Eichner. A sectioned model of a 1962 microscope showing its optical system was given by the E. Leitz Co. A large collection representing the history of the water meter was donated by A. A. Hirsch.

The division of mechanical and civil engineering received an important early (1905) example of steam turbine power, a Parsons turbine with direct-connected direct-current generator. The machine was presented by the Department of the Navy, San Francisco Naval Shipyard, through Eduardo Magtoto, General Superintendent; Varadero de Manila, Republic of the Philippines; and Rear Adm. Charles A. Curtze. Of a number of bridge models received is one of the famed bridge "Colossus." The original was the longest timber span for a century following its construction in 1812. The section of tools received the Rogers Bond Comparator No. 2 from the Pratt & Whitney Co. This was the first instrument in this country used to transfer the length of a standard by microscopic measurement and to subdivide it directly, converting line-standard to end-standard measurement. The section of light machinery acquired, from the American Watchmakers Institute, the James Ward Packard collection of complex watches.

Senator Leverett Saltonstall, Regent of the Smithsonian, presented a piano-box buggy and a fine set of silver-mounted coach harnesses to the section of land transportation. A beautifully restored and fully documented farm wagon of 1860 was donated by Don H. Berkebile. The section of marine transportation acquired several fine ship models, including a downeaster, the *Emily F. Whitney*, and a Pittsburgh & Cincinnati steam packet, the *Buckeye State*.

The division of medical sciences lists as its most important acquisition a 17th-century Lambeth Delft pill tile bearing the coats of arms of the City of London and of the Worshipful Society of Apothecaries. This was received through the generosity of Charles Pfizer & Co., Inc. Other gifts include the first ionization X-ray condenser dosimeter, developed and donated by Dr. Otto Glasser, and a Cambridge indicator dye-dilution curve apparatus, from Dr. Alfred Henderson.

Through the generosity of Franklin Wingard, the division of electricity acquired a large collection of radio material which greatly strengthens its holdings in this field.

Arts and manufactures.—The division of textiles received an especially well-executed 19th-century appliqué and stuffed-work quilt from Stewart Dickson. A very early silk throw, made for an ante-Civil War bride, was presented by Commander and Mrs. James P. Oliver, John P. Oliver, and their aunt, Mrs. Ruth P. Hall. A very fine

Brussels needlepoint and bobbin appliqué lace collar and Gros Point de Venice lace cape were presented by Mrs. Herbert May. An additional group of seven beautiful oriental rugs was presented by Mrs. Clara W. Berwick. These included examples of wool and silk rugs, which are in both the Selma and Ghiodes knot techniques.

The division of ceramics and glass acquired, from Mrs. Ellouise Baker Larsen, of Lima, Ohio, her entire collection of Staffordshire ware. Consisting of about 900 pieces, this is the most important assembly of these ceramics in America. Mrs. Larsen has spent more than 30 years compiling data and gathering the representative pieces, many of which are extremely rare. Hugh D. Auchincloss, McLean, Va., donated five pieces of ancient glass illustrative of the high degree of artistic skill of the glassmakers when Rome dominated the Mediterranean. Dr. Hans Syz, Westport, Conn., presented another group of 18th-century German porcelains including fine pieces from Meissen, Hochet, Ludwigsburg, Nymphenburg, and Furstenberg.

An important accession of the division of graphic arts was the color aquatint *La Promenade Publique*, by Philibert-Louis Debucourt, generally considered to be the finest example of French color printing of the last quarter of the 18th century. Other outstanding accessions were a chiaroscuro woodcut, *The Death of Ananias*, after Raphael, executed about 1530, by Ugo de Carpi, who is usually accepted as the first and most important Italian chiaroscuro woodcutter; and *The Fountain of Trevi*, one of the most desirable subjects from Giovanni Battista Piranesi's great series of etchings, *Veduta di Roma*, published in 1765.

The eminent Hungarian artist Joseph Domjan, now an American citizen, donated his highly original woodcuts *Starlit Night*, *Peacock of the Carnations*, and *Moon-Shine Peacock*. Through its president, Prentiss Taylor, the Society of Washington Printmakers presented the color lithograph *Black Fire*, by Jack Perlmutter. Mr. Taylor, a well-known Washington artist, also donated a print of his lithograph *La Presa-Marfil*, together with the original preliminary drawing of the subject, the transfer drawings, and the zinc plate used in printing.

The section of photography acquired some notable additions to its historical collections as well as items representative of significant current developments. The Eastman Kodak Co. presented a matchbox camera developed during World War II for the Office of Strategic Services, a 1922 cine-camera, Model-A, their first motion picture camera, and several cutaway cameras illustrative of design changes. Dr. Harold E. Edgerton donated a pair of deep-sea stereo cameras of his design. These were first used in 1954 by Capt. Jacques Yves Cousteau and by the Woods Hole Oceanographic Institution.

Noteworthy donations to the division of manufacturing and heavy industries include a collection of more than 300 tinware items, covering the entire range of the 19th-century tinsmith's art, from Kenneth Jewett. President John F. Kennedy, through the U.S. Atomic Energy Commission, transferred a cube of uranium fuel used by Enrico Fermi in the world's first controlled neutron chain reaction (December 2, 1942). Obtained from the Army Nuclear Power Program was a model of the first land-based nuclear power plant (SM-1), the prototype of small reactors being developed for the use of the U.S. Army in the field, and the Oak Ridge National Laboratory provided a display showing the method of fabrication of the fuel elements used therein. The section of iron and steel was successful in locating the original Ajax-Wyatt electric induction furnace which was transferred by the Ajax Magnethermic Corp.

The division of agriculture and forest products received, from Minneapolis-Moline, Inc., a 1918 Moline Universal Model D tractor with a two-bottom plow attached. The tractor is notable for its use of electrically operated accessories. Another historical item acquired by the division is an 1869 portable steam engine, the first made by the J. I. Case Co. and donated by that firm.

Civil history.—Among the important accessions received in the division of political history is Mrs. John F. Kennedy's gift of her inaugural-ball gown and cape, made of peau d'ange covered with several layers of white silk chiffon. Mrs. Kennedy also presented her dress of white ottoman silk worn at the inaugural gala on January 19, 1961. Items of clothing worn by Presidents William Howard Taft, Theodore Roosevelt, Calvin Coolidge, and Woodrow Wilson were presented by Charles R. Taft, Ralph E. Becker, John Coolidge, and the National Trust for Historic Preservation, respectively. A handsomely bound book presented to Theodore Roosevelt by the Faculty Club of the University of California, *The Silva of California*, was given by his grandson, Cornelius Van S. Roosevelt. A number of items, including a fan, a brown satin apron, and other articles of the clothing which belonged to Dolley Madison, were donated by her great-great-great-grandniece, Miss Barbara Donald. Mrs. Herbert A. May donated the famous Napoleon diamond necklace presented by the Emperor to his wife, the Empress Marie-Louise, on the occasion of the birth of their son, the King of Rome.

To the collections of the division of cultural history were added an important block-front tall clock from Rhode Island, a Philadelphia "pie crust" table, and other significant items, donated by Mrs. Francis P. Garvan. Mrs. Harry T. Peters and her children, Harry T. Peters, Jr., and Mrs. Charles D. Webster, presented 11 large folio lithographs by Currier and Ives and others, a valuable addition to the nearly 2,000

prints given by this family. Mr. and Mrs. A. Philip Stockvis gave a varied group which includes an American Chippendale armchair. For the musical instruments collection, the Le Blanc Corp. presented a basset horn, contra-bass clarinet, bass clarinet, and two alto clarinets.

The division of philately and postal history added 178,626 specimens to its collections. One of the most significant of the recent gifts came from Bernard Peyton of Princeton, N.J., who presented a Confederate States cover, to which is affixed a block of twelve 2-cent Jackson Confederate stamps. This is the largest known block of these stamps on a cover. Funds donated by the Charles and Rosanna Batchelor Memorial, Inc., made possible valuable additions to the Emma E. Batchelor Air Mail Collection.

The division of numismatics received significant contributions of rare half dollars from R. E. Cox, Jr., of Fort Worth, Tex. Extensive donations of the Messrs. Stack of New York City included original drawings for U.S. patterns and medals, and Harvey Stack gave a hitherto unknown variety of the extremely rare Indian Peace Medal dated 1843, portraying President George Washington and distributed by one of the fur-trading companies in the Missouri Territory. To our holdings in modern coins the Honorable R. Henry Norweb of Cleveland, Ohio, contributed a virtually complete collection of Newfoundland issues dating from 1865-1947. Willis H. du Pont of Wilmington, Del., added to his previous donations of Russian coins and medals formerly owned by the Grand Duke Mikhailovitch a group of 778 coins struck during the reigns of Peter III and Catherine II up to 1774, and medals struck during the period from 1762-94. Mrs. Wayte Raymond of New York City contributed 620 important modern coins of the world, and Mrs. F. C. C. Boyd of New York City gave 572 Mexican coins comprising many issues of the Revolutionary Period. Philip H. Chase of Wynnewood, Pa., donated a very rare album, *The Currency of the Confederate States of America*, prepared by Raphael P. Thian about 1880 and containing 286 notes and their descriptions. Mr. and Mrs. Isadore Snyderman of New York City presented to the Smithsonian a unique gold plaquette of 1906, made by Victor D. Brenner in commemoration of the removal of the remains of John Paul Jones from Paris to Annapolis in 1905.

Armed Forces history.—The collections of the division of military history were enriched by a unique Henry rifle once presented to President Lincoln and given to the Museum by Robert Lincoln Beckwith. The William De Laney Travis Civil War panorama "The Army of the Cumberland" was received from C. C. Travis and Mrs. Hattie Kidd. A fine group of decorations awarded to Capt. C. H. Huntington was presented by Mrs. Huntington. A rare Medal of Honor and

associated Civil War medals awarded Lt. Edward B. Williston were received from the Department of the Navy.

The division of naval history acquired, from Capt. P. V. H. Weems, the Weems Memorial Library and its associated collection of navigational instruments illustrative of the progressive solution of problems posed by aerial navigation from its earliest days. The collection includes a notably fine run of Bowditch's *The New American Practical Navigator* from the 1st to 15th editions. Also included are navigation instruments used in the polar flights of Richard E. Byrd and Lincoln Ellsworth.

The division's uniform collection has been greatly enhanced by the gift of Mrs. Ernest J. King, widow of Fleet Adm. Ernest J. King, which included a number of her late husband's uniforms, orders, and decorations.

Philip Wrigley presented rare and interesting naval uniforms including the period of World War I, and an extensive collection of contemporary naval uniforms was presented by the Department of the Navy and Jacob Reed & Sons of Philadelphia.

The U.S. Coast Guard transferred a wide selection of objects pertaining to the history of that service. These included items of ordnance, two sets of gangway headboards, a first order catadioptric lens, original drafts of a wide variety of lighthouse lenses, a lifeboat and fully equipped beach cart, and, most important, eight extremely handsome models of revenue cutters. Floyd D. Houston of New Suffolk, N.Y., presented his finely executed model of the submarine *Holland*, first submarine in the Navy.

Through the courtesy of M. E. Tucker and the government of Bermuda, head curator Mendel L. Peterson and museum technician Alan B. Albright collected a significant number of artifacts from underwater sites in the Bermuda reefs. These included materials of glass, ceramics, and metal from sites dating from 1595 through 1838.

EXPLORATION AND FIELDWORK

Dr. R. S. Cowan, assistant director of the Museum of Natural History, conducted a 5-week expedition to Baja California, Mexico, in February and March, primarily to collect data and materials for constructing a desert-life group in the future hall of plant life. With the assistance of modelmaker Paul Marchand and sculptor-artist Vernon R. Rickman, fiber-glass models and plaster models were prepared of several cacti and other plants characteristic of the desert. Dr. Cowan also made a systematic collection of wood specimens, almost half of which are new to the Smithsonian Institution wood collection.

During November and December, Dr. I. E. Wallen, assistant director for oceanography, visited institutions specializing in marine

sciences in England, Denmark, Sweden, Holland, France, Monaco, and Italy. He obtained information which has been useful in the planning of the Smithsonian Oceanographic Sorting Center. The establishment and functioning of this Center constitute perhaps the most important single accomplishment of the first year of the oceanography program. At the close of the year Dr. Wallen was in East Pakistan on a temporary assignment as visiting professor of zoology for the Asia Foundation.

During September and October Dr. T. D. Stewart, then head curator of anthropology (now director of the Museum of Natural History), was in Baghdad, Iraq, reconstructing and studying the remains of Neanderthal skeletons IV and VI recovered in Shanidar Cave in 1960. The results of this year's work, embodied in a manuscript scheduled to be published in *Sumer*, the Journal of Archaeology and History in Iraq, led Dr. Stewart to the conclusion that the Shanidar Neanderthal population remained fairly homogeneous throughout the estimated 15,000 years during which their skeletons accumulated in the cave.

The investigation of the late Pleistocene bone bed near Littleton, Colo., was underway again at the beginning of the year. Dr. Waldo R. Wedel, then curator of archeology (now head curator of anthropology), museum specialist George Metcalf, and exhibits specialist Peter W. Bowman continued to work until late in August, by which time some 2,400 square feet of deposits around an ancient spring had been excavated to depths up to 11 feet and extensive additional collections made of mammoth, bison, and other mammal bones. Although conclusive evidence of man's association with the mammoth was not obtained, a stratified section of the deposit and recovery of several key artifact types in situ established man's presence here at least as far back as 7,000 years ago.

From January to March Dr. Saul H. Riesenbergs, curator of ethnology; Dr. Clifford Evans, curator of archeology; and Dr. Betty J. Meggers, honorary research associate, were on the island of Ponape in the Caroline Islands of the Trust Territory in the Pacific studying ancient megalithic structures and the traditions relating thereto. Just off the eastern end of Ponape is a complex of artificial islets, known as Nan Madol, on which are structures made of columnar basalt. By using 25 workmen to clear the areas to be investigated, Drs. Evans and Meggers were able to excavate and map eight distinct parts of the complex. In the process they collected typical artifacts and a sequence of carbon samples which may yield reliable dates. The team spent 6 weeks at the site, Dr. Riesenbergs collecting the traditions related to the structures and Drs. Evans and Meggers investigating the archeological clues and interpretations provided by these traditions

and, consequently, offering new leads for ethnological explorations. As a result of this unusual approach, they concluded that orally transmitted tradition has greater historical validity, at least in this area, than is generally recognized by most anthropologists.

After finishing their work on Ponape, Drs. Evans and Meggers went to Japan and Taiwan to consult with Japanese and Chinese archeologists and to examine sites and collections of the Early-Middle Jomon Culture of Japan in order to determine the relationship between that pottery complex and the pottery complexes relating to the early Valdivia Culture of coastal Ecuador. The Valdivia Culture has yielded the earliest dated pottery in the New World (5,000-4,050 years before the present, as determined by carbon-14 tests). Not only is this pottery unexpectedly early for the New World, but also it indicates no relationship with any known New World culture. Since the Jomon pottery shows surprisingly similar features, and is of about the same antiquity, the records obtained during this trip open up many doors to research on the problem of transpacific movements of early populations.

While in Japan, Drs. Evans and Meggers examined the collections made by staff members of the University of Tokyo during two archeological expeditions to the northern Andes of Peru. Here also the pottery was found to bear directly upon some of the cultures of Ecuador. These rewarding contacts between American and Japanese archeologists having mutual interests promise to open up a fruitful era of cooperation.

Late in August Drs. Evans and Meggers, together with Dr. William H. Crocker, associate curator of ethnology, attended the 35th International Congress of Americanists in Mexico City, after which they examined collections and sites in various parts of Mexico, giving particular attention to those in Yucatán.

Dr. Henry W. Setzer, associate curator of mammals, was engaged during much of the year in organizing and supervising field parties operating in Asia, Madagascar, and Mexico with the objective of making collections of small mammals and their ectoparasites. Late in August he went to London to study type and other specimens of mammals in the British Museum (Natural History). After this he spent brief periods with field parties in West Pakistan and along the Afghanistan border in Iran, consulted with American officials in Cairo, Egypt, and helped the Madagascar field party initiate work in the vicinity of Ihosy. Another trip late in February and early in March took him to Mexico, where he joined a field party on the Mexican plateau.

Col. Robert Traub, who in January was appointed honorary research associate, worked closely with Dr. Setzer in organizing and

participating in fieldwork in widely separated areas. During most of September and October he collected small mammals and their ectoparasites in West Pakistan, particularly in the Kagan Valley and in the vicinity of Lahore and Sialkot. From there he went to northern Thailand for 4 weeks. Then, late in February, he spent a month in Mexico collecting in the States of Veracruz, Guerrero, México, Nuevo León, and Tamaulipas.

From January to April Dr. Charles O. Handley, Jr., associate curator of mammals, with the assistance of Frank M. Greenwell of the Smithsonian's office of exhibits, continued his major project of studying the mammals of Panama. The areas investigated this year were the San Blas coast in extreme eastern Panama and the Bocas del Toro Archipelago and adjacent mainland near the Costa Rican boundary. The resulting mammal collection amounted to 1,914 specimens.

In order to study the relationship of birds to arthropod-borne virus diseases, especially eastern equine encephalitis, Dr. Philip S. Humphrey, curator of birds, collected extensively in the vicinity of Belém and in Bragança, Brazil, from the end of January to the end of April. In this work he had the cooperation of the Belém Virus Laboratory, Fundação Serviço Especial de Saúde Pública, and the Museu Paraense "Emilio Goeldi," all of Belém. In addition to 986 skins and 1,035 anatomical specimens, he took over 1,100 liver and 788 blood samples. Since three or four different habitats are represented, Dr. Humphrey hopes that the serological findings can be subjected to ecological analysis.

Field studies concerned with the birdlife of the Isthmus of Panama, under Dr. Alexander Wetmore, honorary research associate and retired Secretary of the Smithsonian Institution, covered the period from early in January to late in March. The first work of the season centered on the white-winged dove colonies found last year in the extensive mangrove swamps along the lower Río Pocrí, below Aguadulce in the Province of Coleé. These colonies were especially interesting, since elsewhere the doves inhabit drier upland localities. Traveling by dugout canoe along the river channels during these investigations, Dr. Wetmore found also the rare rufous-crowned wood rail, *Aramides axillaris*, known previously in Panama only from a few reports around Almirante Bay on the Caribbean coast. In addition, he obtained information on wintering dowitchers among the many sandpipers, and on gull-billed terns, all migrants from the north.

Late in January Dr. Wetmore was a guest on the small motor vessel *Pelican* engaged in a study of the distribution of the spiny lobster, a cooperative project between the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service and agencies concerned with assistance to the Panamanian Government. Their route through the

Canal and along the Pacific coast to islands off western Chiriquí gave opportunity for daily work ashore on Isla Parida and Isla Bolaños, in continuation of the island survey of last year on the launch *Barbara II*.

On his final fieldwork of the season Dr. Wetmore arranged a charter flight on a small plane east to Puerto Obaldía on the San Blas coast near the boundary with Colombia. After a few days' work near the town, he established a camp, in company with mammalogist Dr. Charles O. Handley, Jr., in the high forest back of Armila, the easternmost village of the Cuna Indians. Three pairs of the rare ant-bird *Xenornis setifrons*, known previously from five specimens, were special prizes here.

As last year, the Gorgas Memorial Laboratory of Panama provided Dr. Wetmore with one of their technicians, Rudolfo Hinds, to serve as field assistant.

Dr. Doris M. Cochran, curator of reptiles and amphibians, in company with entomologist Mrs. Doris H. Blake, honorary research associate, was in South and Central America from the beginning of December through February visiting museums and making collections. The countries visited included Brazil (Brasilia, Rio de Janeiro, São Paulo, Santos, and Curitiba); Argentina (Foz de Iguassu, Buenos Aires, La Plata, Vila Bela); Peru (Lima, Pachacamac, Río Blanco, and Río Rimac); Colombia (Cali, Palmyra, Bogotá, and Medellín); and the Canal Zone (Barro Colorado Island). As a result of the information and specimens obtained, Dr. Cochran expects to complete reports on the frogs of central Brazil and of Colombia, the latter in collaboration with Dr. C. J. Goin of Gainesville, Fla.

Two associate curators of the division of fishes, Dr. Victor G. Springer and Dr. William R. Taylor, participated in oceanographic expeditions during the year. Dr. Springer was on the oceanographic vessel *Geronimo*, operated by the Fish and Wildlife Service, when she left Boston for West Africa on March 5. Unfortunately, 4 days later the vessel malfunctioned and had to be towed into Bermuda for repairs, but again departed for Africa on March 12. During the 3 days in Bermuda Dr. Springer was able to make only night-light collections. After leaving Bermuda the vessel again malfunctioned and had to be towed back to port. Thereupon the cruise was canceled, and Dr. Springer, after further attempts at shore collecting, left for Washington by air. In spite of limited collecting opportunities and unfavorable weather conditions, he returned with about 300 specimens.

Dr. Taylor joined the *Anton Bruun* of the International Indian Ocean Expedition when she left Bombay, India, early in March on her first cruise designed to obtain physical data and biological material from the Andaman Sea and Bay of Bengal. Malfunction of the

electrical equipment, winches, etc., and difficulties in obtaining fresh water caused changes in schedules and restricted the activities of the biologists aboard. As a result, Dr. Taylor late in April left the ship at Vizagapatam. The collections obtained were limited to the Andaman Sea and offshore areas west of Burma.

From early in March to late in May Dr. J. A. F. Garrick, research associate in the division of fishes, visited several museums and other institutions in Europe and Africa primarily to examine type material of the shark genus *Carcharhinus* for his revision of the group. He also wished to obtain additional locality records and to ascertain if any species had been overlooked or are not represented in the collections of U.S. museums thus far seen. Dr. Garrick's findings show that much of the current nomenclature for the group is in error, particularly in regard to species of the Indo-Pacific, based primarily on the literature rather than on examination of types. As a result of this fieldwork, locality records for many species were greatly extended, and in several cases species thought to be restricted to one ocean were found to occur in other oceans or to be worldwide in distribution. The number of recorded species was increased by two. Because of the value of vertebral counts in identifying shark species, Dr. Garrick X-rayed critical specimens whenever possible. About 90 specimens were so examined. In this and all other respects he received the fullest cooperation from the staffs of the institutions visited.

From the middle of July through August Dr. J. F. Gates Clarke, curator of insects, conducted extensive field studies in Oregon and Washington. While in Oregon he had the company of a colleague, James Baker, of Burns, Oreg. From numerous stations set up for collecting purposes at various altitudes, they obtained over 7,000 specimens, including many novelties, which eventually will contribute much to our knowledge of the ecology and distribution of Microlepidoptera of the Pacific Northwest.

From the beginning of June until the end of September Dr. Ralph E. Crabill, Jr., associate curator of insects, conducted further studies of myriapods, particularly in museums in Munich, Vienna, Hamburg, Copenhagen, and London. He was able to locate and examine previously unknown material. He also spent a couple of weeks in the Bavarian Alps collecting topotypical specimens of centipedes for the national collections.

Since joining the staff as associate curator of the division of insects this year, Dr. Paul J. Spangler, a specialist in aquatic beetles, has made several collecting trips, the longest of which, December 15-January 26, took him to Puerto Rico and the Virgin Islands. Although the insect fauna from Puerto Rico is better known than that from other Caribbean islands, he found numerous new records and new species

and collected approximately 14,000 insects. Although this material has as yet been examined only cursorily, 1 family (Isometopidae), 12 genera previously unknown from the island, and numerous new species have been identified. The number of species of aquatic beetles known from Puerto Rico has been increased from approximately 40 to 75, and larvae of about 35 of these have been established by rearing or association. The number of aquatic beetle species known from the Virgin Islands has been tripled.

During 2 weeks in August Dr. Spangler collected also in South Dakota, Wyoming, and Montana, concentrating in the numerous and unusual habitats in Yellowstone National Park and vicinity. He collected approximately 10,000 insects during this trip. Although this material has not yet been thoroughly examined, several new species of water beetles have been found. In several rare genera the number of specimens present in the national collection has been doubled. In addition, rare and undescribed larvae of several species have been found and associated with their adults.

At the beginning and end of the year Dr. Spangler in company with other members of the staff made day-long trips to collecting areas in Maryland and West Virginia. A trip to the vicinity of Oakland in Garrett County, Md., yielded several rare species for the first time and one apparently new species.

Dr. Oliver S. Flint, Jr., associate curator of insects, continued his research on caddisflies. This year his major collecting effort came during the latter part of July when he went to Jamaica and again to Puerto Rico. On the island of Jamaica he obtained well over 1,000 specimens of caddisflies belonging to about 20 species. Almost all these species are new to science, and one represents a genus new to the Antilles. The collection of nearly 5,000 specimens from Puerto Rico included an undescribed caddisfly belonging to a genus unrecorded from that island.

During the latter part of May, Dr. Flint, accompanied by William D. Field, made a 12-day trip through the Jefferson and Monongahela National Forests in Virginia and West Virginia to Bluestone State Park in West Virginia. Little collecting of aquatic insects has been done in this area.

A 12-day collecting trip for butterflies was made late in August by William D. Field, associate curator of insects, along the Blue Ridge Parkway in Virginia, North Carolina, South Carolina, and Tennessee to the Great Smoky Mountains National Park. The 392 specimens obtained include species which contribute importantly to knowledge of these insects. As mentioned above, Mr. Field also accompanied Dr. Flint on a trip into the mountains of western Virginia and eastern West Virginia in the vicinity of Lewisburg, W. Va. Here he found

a specimen of *Pieris virginiensis* Edwards, one of the rarest of eastern butterflies. Over 100 mature larvae of *Euphydryas phaeton* Drury and a good series of *Glaucopsyche lygdamus* Dbldy., another early spring rarity, also were collected.

During the latter part of August Dr. Donald R. Davis, associate curator of insects, conducted studies on Microlepidoptera in the Tenkiller Lake district of Oklahoma. As this is an area practically unknown entomologically, these studies were particularly significant in producing information on distribution, ecology, and new species. Prior to this, in July, on a visit to the Dismal Swamp area of Virginia in company with Dr. Flint, Dr. Davis collected 300 specimens of Microlepidoptera, along with a sizable sample of leaf miners. Three species of leaf miners were reared, and leaves mined by several additional species were collected.

Associate curator O. L. Cartwright, who in May accompanied Dr. Spangler to the vicinity of Oakland in Garrett County, Md., collected specimens of seven species of Scarabaeidae, including three rare species, the basis for new Maryland State records, and one species (nine specimens) apparently new to science.

During July Dr. Donald F. Squires, associate curator (now curator) of marine invertebrates, was in New Zealand conferring with officers of the New Zealand Oceanographic Institute regarding the identification and study of deep-water coral banks, and with the New Zealand Geological Survey staff regarding the occurrence of such banks as fossils. At the Auckland Museum and Institute he studied recent collections of corals, particularly those made by fisheries research vessels. He also examined outcroppings of fossil deep-water coral banks at two localities in Wairarapa.

In November, while participating in the annual meetings of the Bahamas National Trust, Dr. Squires conducted preliminary explorations, with other members of the Trust, of the reef tracts at Lyford Cay, New Providence Island.

From late in March to early in May, Dr. Squires carried out field work on R/V *Chain* of the Woods Hole Oceanographic Institution, as part of the international Equivalent I operation, in the area from Recife, Brazil, to Trinidad and east to longitude 25° W. He collected samples and made numerous bathymetric observations on the structures known as shelf-edge prominences off the Orinoco River Delta. Also, he made collections of corals from 40 to 200 fathoms in the vicinity of St. Paul's Rock and in the approaches to Paramaribo, Surinam.

As a participant in the International Indian Ocean Expedition from the middle of January to the middle of March, Charles E. Cutress, Jr., associate curator of marine invertebrates, visited the Indian Museum

at Calcutta and studied sea anemones at Port Canning, the University of Madras, the Central Marine Fisheries Research Institute at Mandapam Camp, the Porto-Novo Marine Biological Station, and the Institute of Science of the University of Bombay. En route to India Mr. Cutress examined anemone types at the British Museum (Natural History) and, on the way home, studied and collected anemone material at the Stazione Zoologica di Napoli. These studies will contribute to the solution of major problems of long standing in the classification of the sea anemones.

As biological consultant of the National Science Foundation, Dr. Waldo L. Schmitt, honorary research associate, late in November joined an expedition to the Palmer Peninsula, Antarctica, to survey possible sites for a scientific station in that area. Delays in obtaining transportation on an icebreaker afforded Dr. Schmitt the opportunity to visit institutions and consult with biologists in New Zealand, particularly at Christchurch, and to visit the USARP McMurdo Station on the shores of the Ross Sea ice shelf. He finally sailed on the U.S.S. *Staten Island* on January 5. During the ensuing 2½ months before returning to the Museum, he examined 20 possible sites for a station from the point of view of logistics, engineering problems, meteorological conditions, and biological potential. At the same time he made land, shore, and offshore collections by various means, including hook and line, traps, tow nets, and dredges.

Continuing his work on the marine mollusks of the Indo-Pacific region, Dr. Harald A. Rehder, curator of mollusks, collected on the island of Tahiti from mid-January to mid-March. Here he concentrated efforts in the coastal area immediately to the east of Papeete but also made several trips around the island, obtaining a good representation of mollusks from numerous localities in almost all districts. Dr. Rehder also gathered fresh-water mollusks at the mouths and along the courses of the three principal streams that traverse the Districts of Pirae, and examined the area for land snails. The results of this trip will assist in planning for future fieldwork in the southern Polynesian area.

In connection with his studies on the families Tridacnidae and Littorinidae of the Indo-Pacific region, Dr. Joseph Rosewater, associate curator of mollusks, spent 6 weeks during February and March on Eniwetok Atoll in the Marshall Islands utilizing the excellent facilities of the Eniwetok Marine Biological Laboratory of the Atomic Energy Commission. Representatives of all four species of Tridacnidae living around the atoll were collected and maintained in the laboratory. The brightly hued mantles of these specimens provided valid distinguishing differences, and dissection of the animals yielded additional valuable information regarding their anatomical distinc-

tions. Although a spawning reaction was induced in two individuals of one species by the introduction of the sex products of a third, no development of possible fertilized eggs could be noted. It is theorized that natural spawning in this group may occur during the warmer summer months and that the event is initiated by the occurrence of a particular water temperature. Similar studies were carried out on specimens of Littorinidae.

In connection with her research on Leguminosae, Dr. Velva E. Rudd, associate curator of phanerogams, joined a group of botanists from the University of California and the University of Mexico during December in a 10-day field trip in the region of San Blas, Mexico. En route she spent 2 days in Mexico City at the Instituto de Biología, University of México, examining plant specimens. The collections and field experience will be helpful in planning more intensive future work in the area.

Dr. John J. Wurdack, associate curator of phanerogams, returned in December from Peru where he had continued on the field trip reported last year. Most of his collecting centered around Chachapoyas in the northern highlands, with the last few months spent along the Río Marañón from below Pongo de Rentema to Pongo de Manseriche in the tropical rainforest. Total specimens exceed 12,000. Dr. Wurdack attributes much of the success of the trip to the help received from the staff of the Museo de Historia Natural "Javier Prado" in Lima, where one complete set of his specimens has been deposited.

Dr. Harold Robinson, associate curator of cryptogams, spent most of May collecting bryophytes in Mexico. The work centered in the Valle Nacional area of northern Oaxaca, with short visits to Chiapas and Guerrero. Dr. Robinson estimates that about 300 specimens from the collection will be retained.

Early in December, an algologist, Dr. Richard Norris, was added to the staff as associate curator. He left Washington almost immediately to join the first and some of the subsequent cruises of the *Anton Bruun* of the International Indian Ocean Expedition.

While in Trinidad attending the Neotropical Botany Conference early in July, Dr. William L. Stern, curator of plant anatomy, gathered a small group of wood specimens from the northern part of the island. In the latter part of August, while on his way to attend the meetings of the American Institute of Biological Sciences in Corvallis, Oreg., he collected wood specimens in the Rocky Mountains of Colorado and in the Cascade and Coast Ranges of Oregon.

During February and March, Dr. Stern, accompanied by two other members of his division, Dr. Richard H. Eyde, associate curator, and Edward S. Ayensu, research assistant, conducted fieldwork in Pan-

ama, collecting not only specimens of fossil woods but also conventional herbarium specimens and associated wood samples in the fossil localities for comparison with the fossil flora. An abundance of fossil woods was found on the Azuero Peninsula, particularly in the environs of the village of Ocú. Two other localities for fossil woods, both on the isthmus proper, were discovered, one near the town of La Mesa and the other near Colorado, a tiny settlement southwest of Calobre. Petrifactions from the two new areas superficially resemble those from Ocú.

Dr. G. A. Cooper, head curator of geology, in company with Drs. Thomas G. Gibson and Druid Wilson of the U.S. Geological Survey, in October visited a fossil site near Hampton, Va., known as Rice's Pit. Although this has become a very popular place for collecting, Dr. Cooper and his party obtained some good material, especially of the smaller fossils. Mr. and Mrs. William M. Rice, who own the pit, and Mrs. George Webb, a neighbor, donated examples of the rarer species.

For a month beginning late in April, Dr. Cooper was occupied in a revisionary study of the stratigraphy of the Glass Mountains in the vicinity of Marathon, Tex. He was assisted by Dr. Richard Grant, of the U.S. Geological Survey, and John L. Carter, museum technician. The trip took them to a number of places not heretofore visited by geologists and accessible only with great difficulty. The objective was to verify new views on Glass Mountains stratigraphy which had been developed as a result of work done on the brachiopods therefrom.

Dr. Cooper and his party spent a day at the end of May in the Chinati Mountains south of Marfa, Tex., looking for certain types of fossils reported to occur in that locality. From here they went to Van Horn, Tex., which they used as a base for forays into the Sierra Diablo, Guadalupe, and Apache Mountains.

Early in September, Edward P. Henderson, associate curator of mineralogy and petrology, and Roy S. Clarke, Jr., analytical chemist, attended an informal conference in the British Museum (Natural History) on methods of chemical analysis of meteorites. Before and after the meeting they inspected the museum's collections of meteorites and tektites and conferred with staff members about problems of organization, equipment, and scientific procedure.

In the Netherlands, Messrs. Henderson and Clarke visited the University of Utrecht and Prof. G. H. R. von Koenigswald, who has one of the world's finest tektite collections. Arrangements were made with him for an exchange. In Mainz, Germany, they discussed mutual problems with the staff of the Max Planck Institute. Dr. H. Wänke of the institute showed them a new shipment of tektites from which

he generously proffered a selection of interesting and unusual specimens. A visit also was made to the University of Heidelberg.

Mr. Clarke then returned home by way of England, stopping again at the British Museum, while Mr. Henderson continued on to Copenhagen, where he studied the meteorite collection in the Danish National Museum and arranged to exchange Philippine tektites for much-needed moldavites. He also spent 2 days with Dr. Vagn Buchwald, metallurgist with the Laboratory of Metals in Copenhagen, who is working on some specimens that were described from Smithsonian collections.

Back in England early in October, Mr. Henderson visited Dr. H. J. Axon of the department of metallurgy, University of Manchester, who also is working on specimens that have been studied in our laboratory. Next, he called on the York firm of Cooke, Troughton & Simms which made the metallograph used in our laboratory. Besides giving Mr. Henderson expert advice on the care and use of the instrument, members of the firm offered to make pictures of one of the meteorites he had with him.

A collecting party from the division of invertebrate paleontology, consisting of Dr. R. S. Boardman, curator; Dr. F. M. Hueber, associate curator; Dr. J. Utgaard, research associate; and F. J. Collier, museum specialist, went to western New York State for 3 weeks late in May. Following a reconnaissance of the Hamilton strata in the Cayuga Lake region, Drs. Boardman and Utgaard and Mr. Collier went on to Lockport, leaving Dr. Hueber at Cornell University to study paleobotanical collections housed there. In the Lockport area they obtained large numbers of Silurian Bryozoa which will enable reevaluation and statistical analysis of many species. Dr. Hueber rejoined the group at Batavia, where detailed collecting of the Hamilton strata was undertaken. As the party moved eastward to the Finger Lakes region, they made extensive collections of Bryozoa from many localities at several stratigraphic intervals. A few fossil plant specimens were obtained which are considered especially important in taxonomic and morphologic interpretations. After Dr. Boardman returned to Washington, the rest of the party continued the stratigraphic reconnaissance and detailed collecting eastward to the Ithaca area. The entire trip resulted in approximately half a ton of specimens, most of which fall into groups previously poorly represented in the collections.

Late in October, Dr. Richard Cifelli, associate curator of invertebrate paleontology, obtained material for his study of the distribution of planktonic Foraminifera in the North Atlantic during the 2-week cruise of the R/V *Crawford* from Woods Hole, Mass. He collected

28 plankton samples on a track from Cape Cod to the vicinity of Puerto Rico to Bermuda.

For another scientific cruise beginning late in March, Dr. Cifelli joined the R/V *Chain* at Recife, Brazil, as a participant in the International Tropical Atlantic Ocean Expedition. Of particular interest to Dr. Cifelli were the nearly 100 plankton hauls collected which he will examine for Foraminifera in connection with his long-range program to study the relationship between the distribution of surficial planktonic Foraminifera and oceanic circulation in the North Atlantic. Also of importance for the study of Foraminifera were the 12 piston long-cores and numerous bottom sediment samples collected from the abyssal plain, continental slope, Orinoco shelf, and the Gulf of Paria.

In June and July Dr. Erle G. Kauffman, associate curator of invertebrate paleontology, and F. J. Collier, museum specialist, spent 6 weeks completing a biostratigraphic study of the lower Colorado group along the Front Range of the Colorado Rockies, tracing faunal zones, refining the zonation by use of ammonites and pelecypods, and tracing disconformities and facies change. They were able to tie in 60 detailed stratigraphic sections along the Front Range and to correlate them with others in northern New Mexico and southern Wyoming, as well as with others in the intermontane parks of the middle Rockies. Approximately 4,000 specimens were collected, predominantly pelecypods and ammonites.

While studying at the U.S. Geological Survey offices in Denver, Colo., during October, Dr. Kauffman spent two weekends in the vicinity of Colorado Springs collecting from previously measured Upper Cretaceous sediments. This resulted in the addition of approximately 300 well-preserved pelecypods and ammonites to the collections.

A number of short excursions to the Upper Cretaceous outcrops of Maryland were undertaken by Dr. Kauffman and Dr. Norman Sohl, of the U.S. Geological Survey, as part of a continuing restudy of this rich but incompletely known fauna. Large collections from near Brightseat, Md., include many species, particularly gastropods, never before reported in the Middle Atlantic Coast Cretaceous.

Late in August Dr. Nicholas Hotton III, associate curator of vertebrate paleontology, and James W. Kitching, research associate on leave from the Bernice Price Institute in Johannesburg, South Africa, journeyed to the Appalachian Mountains in search of field occurrences of middle and late Paleozoic vertebrate-bearing deposits. In quarries of the Greer Limestone Co., at Greer, W. Va., they collected partial skeletons, including one skull, of at least two amphibians from outcrops of the Greenbriar limestone (Mississippian). While in this area they examined beds above and below the Greenbriar outcrop

along the valley of Stranger Creek but found no fossils. A Greenbriar quarry at Terra Alta, W. Va., also yielded no results, but one at Fairchance, Pa., yielded scraps of fossil fishes.

On September 6, Dr. Hotton, Mr. Kitching, and Gerald R. Paulson, museum technician, went to Chalk Point, in nearby Maryland, to collect the skeleton of a whale discovered during excavation for a facility of the Potomac Electric Power Co. The deposits at Chalk Point are assigned to the Calvert formation, of late Miocene age. The specimen turned out to be a squalodont whale that was about 15 feet long during life; the amount of wear shown by the teeth indicates that the individual was very old when it died. As recovered, the specimen consists of a large part of the lower jaw, a number of vertebrae, ribs, loose teeth, a scapula, and a complete flipper in good articulation. The find is significant as a locality record, and anatomically because of the excellent preservation of the flipper. The degree of wear on the teeth is interesting from the viewpoint of function.

Dr. Hotton and Mr. Kitching conducted October fieldwork in several western States and in a variety of formations ranging in age from Permian to Oligocene. These include the White River Oligocene and Pierre Cretaceous of South Dakota and Wyoming; the Permian, Triassic, and Paleocene of New Mexico; and the Permian and Triassic of Texas. The most spectacular result of the trip was the discovery of an untouched pocket of vertebrates in the lower Permian along West Coffee Creek, Baylor County, Tex., which yielded four complete skeletons and five additional skulls of various amphibians and reptiles, plus a considerable amount of material of an as yet undetermined nature. These specimens represent a good portion of the fauna of the lower Permian of the United States. Most of them have been forwarded to the Bernard Price Institute for Paleontological Research, in Johannesburg, South Africa, in partial reciprocity for the excellent Beaufort material from South Africa that Mr. Kitching's help and the good offices of the institute enabled Dr. Hotton to collect.

Howard I. Chapelle, curator of transportation in the Museum of History and Technology, made brief trips to Madrid and Barcelona, Spain, during December and May to examine the construction of a full-size replica of Columbus's flagship *Santa Maria* and to check the progress of a scale model to be donated to the Smithsonian. The research for this project of reconstruction has been carried on by Captain de Corbita J. M. Martinez-Hidalgo, S.N., director of the Maritime Museum in Barcelona, who previously had done similar research on a Spanish galley of the post-Lepanto period and for a caravel, specifically the *Pinta*. The Maritime Museum is located in an ancient galley yard built before the battle of Lepanto (1571). The original stone

galley slips and sheds remain and are restored and utilized for museum halls. Interestingly, the launching ends of the slips are now about a block from the water.

On his way to attend the 18th International Congress of the History of Medicine, held in Warsaw and Krakow, Poland, during September, Dr. Sami Hamarneh, acting curator of medical sciences, sought information in his fields of interest through visits to the British Museum, the Wellcome Medical Library and Museum, the British Pharmaceutical Society, and a number of institutions in Poland.

In order to collect further data on the life of Frederick Carder, the Englishman who came to America early in this century and established the Steuben Glass Works, Paul V. Gardner, curator of ceramics and glass, made several visits to Corning, N.Y., where Mr. Carder is living, and to various institutions where examples of Carder's work are preserved.

From mid-August to mid-October Jacob Kainen, curator of graphic arts, was in Europe gathering material for an exhibition on typography and doing research for his study of the Dutch engraver Hendrick Goltzius (1558-1617). He obtained typographical material from Monotype House, Ltd., London, and consulted with technicians and historians in London, Haarlem, and Brussels. Also he conducted research in various museums in London, Amsterdam, Rotterdam, Utrecht, Brussels, Paris, Venice, Florence, Rome, Milan, Parma, and Madrid.

John N. Pearce, assistant curator of cultural history, with Richard J. Muzzrole, archeological aide, in October, participated in a 10-day archeological investigation of the site of John Frederick Amelung's "New Bremen Glass Manufactory." This, the first major glassmaking enterprise in the American Republic, was operated between 1785 and 1795 in Frederick County, Md. The excavations were sponsored by the Corning Museum of Glass with the collaboration of the Smithsonian Institution. Ivor Noël Hume, honorary research curator, who is chief archeologist of Colonial Williamsburg, Inc., was director of excavations, and Paul N. Perrot, director of the Corning Museum, was executive director of the project. With the evidence of structures and artifacts thus far revealed, it is expected that the results will contribute significantly to knowledge of 18th-century glassmaking in America as well as yielding particular information about this influential primary source of American glassmaking skills.

In November and again in December Mr. Pearce worked with members of the Maryland Archeological Society in excavations on the Morgan pottery site in Baltimore, a site which dates from the late colonial period. They were fortunate to find in one pit a layer rich with pottery sherds (possibly a working floor) between the undis-

turbed subsoil and a sealing layer of relatively clean sand, presumably fill. Very few pottery fragments other than those of local stoneware were found in the test-hole portion of this layer, but all of those which were found were datable as within the period of operation of the pottery (1794-1837).

Mr. Pearce and Mr. Muzzrole also conducted archeological excavations during May on the site of the early 18th-century City Tavern building in Annapolis. In locating the major foundation they identified four (possibly five) periods of building and found builder's trenches of about 1780 containing cultural materials which after study will make quite accurate dating possible.

At the beginning of the year, through the courtesy of E. B. Tucker and the government of Bermuda, Mendel L. Peterson, head curator of Armed Forces history, and Alan B. Albright, museum technician, collected a number of significant artifacts from underwater sites in the Bermuda reefs dating from 1595 through 1838. The earliest site yielded a rare pewter porringer. The site of the *San Antonio*, a Spanish ship which sank in 1621, yielded more ordnance materials and traces of trade goods. The site of the *Eagle*, a Virginia Company ship which went down in 1658, produced clay pipes, a soapstone bullet mold, and a solid iron shot for the ship's main battery. The site of *L'Herminie*, a French frigate which sank in 1838, was extensively explored, and from it were collected glass and unmarked porcelain from the wardroom services and a collection of perfect bottles, including those for brandy, wine, oil, and clarified olive oil, with the seal of the merchant.

Frank A. Taylor, director, attended the Sixth General Conference of the International Council of Museums at The Hague, July 2-11, 1963, where he was elected president of the International Committee of ICOM for Museums of Science and Technology. He visited museums in Italy, Switzerland, Germany, Holland, and England.

EXHIBITIONS

Highlights in the exhibits program during the year were the re-opening of three large halls of modernized exhibits in the Museum of Natural History and the beginning of the installation of exhibits in the new Museum of History and Technology. With the opening of the second hall of North American archeology, the hall of life in the sea, and the hall of dinosaurs and fossil reptiles, all but three of the galleries on the first floor of the Museum of Natural History have now been modernized. At the end of the year installation of exhibits in four halls of the new Museum of History and Technology began while the construction of exhibits continued. Exhibit units for 15 of the halls in the new museum were prepared.

The new hall of North American archeology includes 38 modernized displays. An introductory section of several units explains the objectives and dating methods of systematic archeology; most of the rest of the hall is devoted to displays of the cultures of Indian groups in various regions of the United States. Curator Waldo R. Wedel prepared the scripts and selected the specimens for this hall with the expert assistance of Dr. C. G. Holland and Dr. W. A. Ritchie. The hall was designed by Ray Hayes and Mrs. Barbara Craig.

Plans for the layout of the new hall of Old World archeology were completed by associate curator Gus Van Beek and exhibits designer R. O. Hower. This gallery will present a synopsis of Old World cultural history from earliest times to the end of the Roman Era.

Contract renovation for the new hall of physical anthropology began on March 30. Exhibits designer Joseph Shannon and director T. D. Stewart, while still head curator of the department of anthropology, completed the plan for the new hall layout and the arrangement of cases. Dr. Stewart prepared detailed scripts for 14 of the exhibits and Dr. Angel completed the specifications for a large map of the peoples of the world.

The new hall entitled "Life in the Sea" was officially opened to the public in February. The most impressive single exhibit here is the life-size blue whale prepared under the direction of Dr. Remington Kellogg, recently retired Assistant Secretary of the Smithsonian Institution. Other mammals depicted include the sea otter, several kinds of porpoises, and five other species of whales. A group of six jellyfishes and comb-jellies is shown by means of eight superimposed reverse-carved sheets of Plexiglas; side lighting provides very life-like qualities. A central alcove in the hall will eventually display deep-sea views, but an exceptionally fine temporary exhibit now occupies this space. In each of the openings in the alcove, shells are presented in a gemlike display which attracts much favorable attention. Among the other temporary installations is an exhibit of 137 species of mollusks found in Polynesia, the Eastern Pacific region, and along our Atlantic coast. This and the other temporary exhibits in the hall will be replaced as rapidly as the permanent exhibit materials can be installed. The hall has been developed under the direction of Dr. Fenner A. Chace, Jr., in cooperation with exhibits designers Thomas Baker, Chris Karras, and Gorman Bond.

Construction in the halls of comparative osteology and cold-blooded vertebrates was virtually completed at the end of the year. Most of the bird and small-mammal skeletons to be exhibited in the hall of osteology were cleaned and restored by Leonard Blush of the taxidermy staff. Dr. Leonard P. Schultz is directing the development of the hall of cold-blooded vertebrates, and scripts for more than half

of the units have been prepared. Several casts of fishes were repaired, and one cast of a record-size 12-foot white sturgeon was produced by John Widener for the case on ancient fishes. This cast was prepared from a specimen obtained through the cooperation of Dr. Murray A. Newman, curator of the Vancouver Public Aquarium.

All curators in the department of zoology participated in the planning and development of a temporary exhibit entitled "Zoology in the Smithsonian Institution" for viewing during the XVI International Congress of Zoology, meeting in Washington during August 1963.

A detailed statement of the purpose and scale for each unit in the future hall of plant life was prepared as a basis for more precise planning of the exhibits in this large gallery. Specifications for models in the rainforest life group were prepared and some of the models made. Early in 1963 a field party spent 5 weeks in the desert of Baja California, Mexico, collecting data and materials for the construction of a desert life group. Dr. R. S. Cowan, assistant director for the Museum of Natural History, led the party and served as technical adviser and photographer; Paul Marchand and Vernon R. Rickman worked together to prepare models, molds, sketches, and other exhibit items. The work of the field party was greatly facilitated by the use of the Vermilion Sea Field Station maintained on the east coast of the peninsula by the San Diego Natural History Museum.

The large modernized hall of dinosaurs and other fossil reptiles was opened to the public in June. The dominance of the dinosaurs in the terrestrial fauna of the Age of Reptiles is illustrated by displays representing all major groups of dinosaurs. Examples range in size from one which had an arm bone 6 feet long to a tiny beast with a thigh bone smaller than that of a chicken. Many of the specimens were collected during the early U.S. Geological Survey explorations associated with the opening of the West between 1870 and 1895. Also displayed in this hall are reptiles from which mammals evolved. These animals apparently were never abundant in the United States, and the exhibited fossils were collected recently in South Africa. The displays of fossil reptiles are related to exhibits of fossil invertebrates, fishes, and mammals in adjoining halls, so that the visitor can follow the history of life from its earliest traces almost to the present. Dr. Nicholas Hotton III, associate curator of vertebrate paleontology, planned the exhibits for the hall with the assistance of exhibit designers Ann Karras and Barbara Craig. Preparation has begun on four dioramas for exhibit on the balcony in the hall of dinosaurs. Using the scale of 1 inch to 1 foot, Jay N. Matternes and Norman Deaton will prepare these dioramas to depict land vertebrates of the

Upper Triassic, the Upper Jurassic, and the Upper Cretaceous, and the sea vertebrates of the Upper Cretaceous. Mr. Matternes completed the third mural painting, for the age of mammals hall, which depicts terrestrial life during the Oligocene in North America. Specifications were prepared for the fourth mural in the hall which will represent animal assemblages in the Pliocene Epoch.

Eight new exhibits to be displayed in the halls of medicine, dentistry, and pharmacy in the new Museum of History and Technology were temporarily installed in the gallery of medical sciences in the Arts and Industries Building; these include units on the development of the microscope, medical and dental equipment, and crude drugs. Exhibits planned or prepared to portray various phases of the history of medicine include a diorama showing the performance of an operation in about the year 1805, the corner of a ward in the Massachusetts General Hospital as it appeared in 1875, and a dental office in Illinois during the period 1912-20. Most of the units have now been designed and produced for these halls under the direction of Dr. Sami K. Hamarneh.

Exhibits for the hall of tools, planned by curator Silvio A. Bedini in cooperation with exhibits designer Harry Hart, neared completion in the exhibits laboratory. Displays of the handtools of the blacksmith, cooper, wheelwright, pump log maker, and woodworking trades were in the designing stage. In mid-June artist R. McGill Mackall of Baltimore installed the first unit in the new hall of tools—a large background painting showing skilled workmen fabricating marine propellers. An exhibit of a mid-19th-century machine shop was moved to the new building and will be erected early in the summer.

The production of exhibits for the civil-engineering hall neared completion with the construction of a series of wooden arches illustrating the American, Austrian, and English systems of tunnel timbering. The Bethelhem Steel Co. fabricated especially for this hall a cast-iron tunnel segment 10 feet in diameter, such as is used for lining tunnels through soft soil. The technical direction of this hall is the responsibility of associate curator Robert M. Vogel, with exhibits designers John Brown and Harry Hart providing the design of individual exhibits.

In preparation for developing the exhibits in the future hall of electricity, associate curator Bernard Finn made a study of the electrical exhibits in the museums of Europe. Substantial progress was made in the design of exhibits in the first third of the hall, devoted to wired communications and power.

At the end of the year, the Pioneer locomotive of 1851 joined the historic engines, coaches, and streetcars now assembled in the railroad hall in the new Museum of History and Technology. These large,

full-scale exhibits will be complemented by a series of models and specimens of equipment which will trace the history of railroads and street railways in the United States. Associate curator John H. White and exhibits designer Virginia Mahoney collaborated in the development and design of this hall.

Curator Paul V. Gardner is revising his plans for the hall of ceramics in order to include important specimens received during the year. Recently acquired 18th-century German and English porcelains, from several donors, were placed on exhibition in the Museum of Natural History.

The American Petroleum Institute continued to render valuable assistance in the planning of exhibits for the new hall of petroleum. A model of the first fluid catalytic cracking plant, which began operation at Baton Rouge, La., in May 1942 to produce high-octane gasoline for the United States and its allies in World War II, was placed on exhibit in the present petroleum hall.

The 50th anniversary of the establishment of the collection of dresses of the First Ladies of the White House was marked by the installation of the Inaugural Ball gown and cape of Mrs. John F. Kennedy. The project of making the mannequins of the First Ladies appear more lifelike has continued. The application of natural flesh tints to the features of more than half of the group has been completed.

Exhibits for the hall of historic Americans, planned by curator Wilcomb E. Washburn in cooperation with exhibits designer Robert Widder, were nearing completion at the end of the year. Assistant curator Anne W. Murray continued to direct the fitting of historic women's dresses and men's suits on the mannequins to be exhibited in the hall of American costume. A series of 4 introductory panels has been designed and 15 exhibits completed for this hall.

The exhibits in the cultural history hall in the Museum of Natural History were dismantled for transfer to the new Museum of History and Technology. The woodwork and fireplaces of the period rooms were carefully disassembled and moved to the new building. Twenty-five exhibits have been produced for the new hall of everyday life in the American past, among them a series of units illustrating the influences upon early American home furnishings of cultural elements imported by Spanish, French, British, Dutch, Flemish, German, and Scandinavian settlers. Installation of this hall is under the direction of curator C. Malcolm Watkins, and exhibits chief John E. Anglim designed the exhibits with the assistance of Deborah Bretzfelder.

A difficult operation was successfully accomplished with the removal of Horatio Greenough's statue of George Washington from the chapel of the Smithsonian Building to the central corridor of the

second floor of the Museum of History and Technology, where it stands at the entrance to the series of halls which will interpret the growth of the United States. Exhibits scripts for three of the five halls illustrating this growth were prepared by associate curator Peter Welsh in collaboration with Dr. Anthony N. B. Garvan, chairman of the Department of American Civilization, University of Pennsylvania. Exhibits designers Robert Widder and Nadya Kayaloff prepared detailed designs for many of the units in the two halls of this series. George Watson restored an 18-century Pennsylvania waterwheel and gear-train which will illustrate the ingenuity and skill of the colonial millwright and demonstrate the use and transmission of power in his time.

The production of exhibits for the hall of philately was begun, and 18 units have been completed. Associate curator Francis J. McCall and assistant curator Carl H. Scheele prepared the scripts for several series of exhibits in the hall devoted to the history of postal services in this country and abroad, methods of postal transportation, mail metering devices, and the design and production of U.S. stamps. Exhibits designer John Clendening is preparing the detailed layouts for these units.

The history of the Armed Forces of the United States in war and peace is the subject of a series of exhibits in the new Museum of History and Technology; curator of military history Edgar M. Howell, curator of naval history Philip K. Lundeborg, and associate curator of naval history Melvin H. Jackson continued to write scripts and provide technical supervision for the design and production of these exhibits. A striking series of models of militarily historic ships was produced during the year. Other exhibits produced depict the role of the Army in the Mexican War, in frontier service during the middle 19th century, and in the Civil War, and the service of the Navy in the Mexican and Civil Wars. Exhibits designer Fred Craig designed the units for these halls.

Design and production of exhibit units for the hall of ordnance are largely completed. Associate curator Craddock H. Goins supplied technical direction for the exhibits, the design of which was contributed by exhibits designer John Brown. Among these is included an interpretation of the interchangeable-parts system of manufacturing, a significant development in the history of firearms. Other units trace the development of naval artillery and naval guns and relate the history of tanks and armored warfare. Dr. Lundeborg prepared detailed specifications for those units concerned with the original Continental gunboat *Philadelphia*, which include original items of equipment recovered with the gunboat itself from the waters of Lake Champlain and graphic materials which help to explain

the battle of Valcour Island on October 11, 1776, in which this gun-boat participated.

Mr. Howell continued supervision of the preparation of the Star-Spangled Banner for exhibition in the central rotunda of the new building. Skilled seamstresses have sewed tapes to the flag backing to support this great national treasure in its new location.

Following his appointment to the directorship of the Museum of Natural History, Dr. T. Dale Stewart assumed the chairmanship of the committee coordinating and supervising the modernization of exhibits in natural history; he also continued planning and development of the new hall of physical anthropology. In addition to planning for the future hall of plant life, Dr. R. S. Cowan, assistant director, coordinated the work of the curators and the exhibits staff involved in preparing exhibits for the Museum of Natural History.

Exhibits chief John E. Anglim continued in charge of the planning and preparation of all exhibits and directly supervised the operation of the exhibit laboratory in the Natural History Building. In June, A. Gilbert Wright joined the staff of that laboratory to assist in its supervision. Julius Tretick supervised the production and installation of natural history exhibits.

The installation of exhibits in four halls of the Museum of History and Technology was initiated late in the year. Exhibit units were prepared for 15 of the halls in the new museum during the past year, and 2 other halls were in the design stage. Assistant director John C. Ewers continued to coordinate the work of curators and exhibits staffs for the new museum. Benjamin W. Lawless supervised the design and production of exhibits for this museum, as well as the preparation of additional displays for the Air and Space Building. He was assisted by Bela S. Bory in production, Robert Klinger in the model shop, and Robert Widder in design. Carroll Lusk entered on duty as exhibits lighting specialist in January. The editing of the curators' drafts of exhibits scripts was continued by George Weiner, with the assistance of Constance Minkin and Edna Wright.

DOCENT SERVICE

For the ninth consecutive year the Junior League of Washington continued its volunteer docent program, conducting school classes from the greater Washington area through the Smithsonian museums. The program was carried out through the cooperation of curator G. Carrol Lindsay, Smithsonian Museum Service, with Mrs. Vernon Knight, chairman of the League's docent committee, and Mrs. Dickson R. Loos, cochairman. Mrs. Loos will serve as chairman for the forthcoming year, with Mrs. Arnold B. McKinnon as cochairman.

During the 1962-63 school year 22,393 children were conducted on 783 tours, representing an increase of 8 percent over the previous year's participation. Since the beginning of the tour program in 1955, more than 100,000 schoolchildren have been guided through Smithsonian museum halls by the Junior League docents.

Tours were conducted in the halls of everyday life in America, Indians of the Americas, the world of mammals, and textiles, for grades 3 through 6; and in the halls of gems and minerals, and power machinery, for grades 5 through junior high school. Tours in the everyday life in early America hall stopped at the end of November so that the exhibit could be moved to the new Museum of History and Technology. The Junior League has guided approximately 22,500 schoolchildren through this hall since it opened in 1957. To replace the early America tour, a new tour through the hall of the world of mammals was offered beginning January 14, 1963. Four tours each day, 5 days a week, were offered every half hour from 10 through 11:30 a.m. in the halls of everyday life in early America, Indians of the Americas, and the world of mammals. Tours in the halls of gems and minerals, textiles, and power machinery were conducted on Monday through Friday at 10 and 11 a.m.

Tours were conducted from October 1, 1962, through May 28, 1963, with the exception of the month of April 1963, when, as usual, tours were suspended because of the exceedingly heavy visitor traffic in all museum halls during the Easter and cherryblossom seasons. The great number of visitors to the Smithsonian museums during the early spring so overcrowd the exhibition halls that the school tours cannot be conducted satisfactorily.

In addition to Mrs. Knight and Mrs. Loos, the members of the League's docent committee were:

Mrs. A. Stuart Baldwin, Mrs. Thad H. Brown, Jr., Mrs. Challen E. Caskie, Mrs. Thomas R. Cate, Mrs. Dean B. Cowie, Mrs. Henry M. deButts, Mrs. Lee M. Folger, Mrs. Rockwood Foster, Mrs. Clark Gearhart, Mrs. George Gerber, Mrs. Gilbert Grosvenor, Mrs. Robert H. Harwood, Mrs. Walter M. Johnson, Jr., Mrs. Charles J. Kelly, Jr., Mrs. Lansing Lamont, Mrs. J. H. Lasley, Mrs. Peter Macdonald, Mrs. John Manfuso, Jr., Mrs. Samuel D. Marsh, Mrs. Earnest May, Mrs. Alexander McClure, Mrs. Robert McCormick, Mrs. Arnold B. McKinnon, Mrs. H. Roemer McPhee, Jr., Mrs. William Minshall, Jr., Mrs. L. Edgar Prina, Mrs. Arthur W. Robinson, Mrs. Donald M. Rogers, Mrs. Robert E. Rogers, Mrs. W. James Sears, Mrs. Walter Slowinski, Mrs. Joseph Smith, Jr., Mrs. James H. Stallings, Jr., Mrs. E. Tilman Stirling, Mrs. William R. Stratton, Mrs. Richard Wallis, and Mrs. Mark A. White.

The Institution deeply appreciates the able and devoted efforts of these volunteers, whose services to the schools of the Washington area encourage effective use of the Smithsonian museum exhibits by teachers and students alike.

BUILDINGS AND EQUIPMENT

During the year the new east wing of the Natural History Building was completed, and the department of geology and the divisions of birds and mollusks moved into their new quarters. For the first time in many years these units have adequate workrooms and laboratories as well as sufficient space in which to arrange the systematic reference collections for the most effective service to the scientists who employ these unduplicated materials in essential research. The contract for the construction of the west wing and the remaining required renovation of the existing building had not been awarded at the close of the year.

In May 1963, the General Services Administration accepted a limited area of the new Museum of History and Technology Building from the general contractor. Exhibits for a number of halls in this area have been moved to the building, and at the end of the year installations were proceeding in several halls concurrently. At the close of the year the construction of the building was estimated to be 98 percent complete.

CHANGES IN ORGANIZATION AND STAFF

Upon the retirement of Dr. A. Remington Kellogg on October 31, 1962, as director of the United States National Museum and as Assistant Secretary of the Smithsonian Institution, Dr. Albert C. Smith, then director of the Museum of Natural History, was appointed Assistant Secretary. Frank A. Taylor became the director of the United States National Museum in addition to being director of the Museum of History and Technology.

On March 26, 1963, Mr. Taylor received one of the 10 National Civil Service League's career service awards for 1963.

On November 1, 1962, Dr. T. Dale Stewart, head curator of anthropology, became director of the Museum of Natural History. On December 9, 1962, Dr. Richard S. Cowan was appointed assistant director of the Museum of Natural History. Dr. I. E. Wallen, formerly associated with the Atomic Energy Commission, was appointed assistant director for oceanography on August 5, 1962.

During the fiscal year 1963, the following appointments were made to the scientific staff of the Museum of Natural History: Dr. Paul J. Spangler, associate curator of insects, on July 8; George E. Watson, assistant curator of birds, on August 6; Dr. Donald Duckworth, associate curator of insects, on August 19; Dr. Victor G. Springer, associate curator of fishes, on August 28; Dr. J. Lawrence Angel, curator of physical anthropology, on September 4; Stanywn G. Shetler, assistant curator of phanerogams, on September 4; Dr. Harold E. Robinson, associate curator of cryptogams, on October 15; Dr. Richard H. Eyde,

associate curator of plant anatomy, on October 18; Dr. Francis M. Hueber, associate curator of invertebrate paleontology and paleobotany, on November 1; Dr. Richard E. Norris, associate curator of cryptogams, on December 4; Dr. Stanley H. Weitzman, associate curator of fishes, on January 2; Dr. Robert H. Gibbs, Jr., associate curator of fishes, on January 30; Dr. Marian H. Pettibone, associate curator of marine invertebrates, on March 4; Dr. Martin A. Buzas, associate curator of invertebrate paleontology and paleobotany, on June 5; Dr. Herman A. Fehlmann, supervisor of the Smithsonian Oceanographic Sorting Center, on June 17; Dr. Raymond B. Manning, associate curator of marine invertebrates, on June 24.

Dr. David H. Dunkle was reinstated in his position of associate curator of vertebrate paleontology on December 16, 1962, after an absence of 2 years with the U.S. Geological Survey on assignment to Pakistan.

Dr. Marshall T. Newman, associate curator of physical anthropology since 1942, resigned on July 6, 1962, to accept a teaching position at Portland State College in Oregon.

Dr. Robert E. Snodgrass, honorary collaborator since 1953 and one of the world's leading scholars in insect anatomy and morphology, died September 4, 1962, at the age of 87. At the time of his death he was preparing a handbook of insect morphology for students. His major work, *Principles of Insect Morphology*, published in 1935, stands as a basic text in the field. On the occasion of his 84th birthday in 1959 a special volume of the Smithsonian Miscellaneous Collections, entitled *Studies in Invertebrate Morphology*, was published in his honor. In 1961 he was awarded the Leidy Medal by the Academy of Natural Sciences of Philadelphia.

Among the additions to the staff of the Museum of History and Technology were the appointments of Dr. Bernard S. Finn as associate curator in charge of the division of electricity on August 20, 1962, and J. Jefferson Miller II as assistant curator in the division of ceramics and glass on September 17, 1962. Miss Barbara F. Bode was appointed junior curator in the division of numismatics on September 24, 1962. A. Gilbert Wright became assistant chief of the Natural History Exhibits Laboratory on June 2, 1963, coming to the Smithsonian Institution from the National Park Service.

George T. Turner, associate curator in the division of philately, left the Museum of History and Technology on March 1, 1963, and Dr. Charles O. Houston, Jr., associate curator in the division of manufactures and heavy industries, on March 8. Dr. Lester C. Lewis, curator of the division of physical sciences, resigned on April 12, 1963. Joseph E. Rudmann of the office of head curator, department of science and

technology, transferred to a position elsewhere, effective May 10, 1963.

Respectfully submitted.

FRANK A. TAYLOR, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the International Exchange Service

SIR: I have the honor to submit the following report on the activities of the International Exchange Service for the fiscal year ended June 30, 1963:

The original plan of organization of the Smithsonian Institution, presented to the Board of Regents by Joseph Henry in 1847, provided for a system of exchange of current Smithsonian publications which would afford the Smithsonian Institution the most ready means of entering into friendly relations and correspondence with all the learned societies in the world and of enriching the Smithsonian Library with the current transactions and proceedings of foreign institutions.

When the first of the Smithsonian's long series of scientific publications was published, copies were sent to scientific and learned institutions in foreign countries. In return, the Smithsonian Institution received many valuable publications from foreign institutions. To continue this desirable international exchange of scientific information, the Smithsonian Institution appointed agents in a number of foreign countries to distribute the Smithsonian publications. In return, these agents received publications from foreign organizations which were forwarded to the Smithsonian Institution.

In 1851 the privilege of transmitting publications through the Smithsonian Institution to other countries, and to receive in return publications from foreign institutions, was offered to governmental agencies, learned societies, and individuals in the United States. This opportunity for wide distribution of scientific publications was eagerly grasped and the system grew rapidly. Thus began a Smithsonian service that has increased steadily in usefulness, and the quantity of material handled has increased from a few hundred packages of publications transmitted in 1849 to more than a million packages during the last fiscal year.

In 1867 Congress provided that copies of all documents thereafter printed by order of either House be placed at the disposal of the Joint Committee on the Library to be exchanged through the agency of the Smithsonian Institution. This was the first official recognition of the Smithsonian exchange system. In 1875 there began a series of international meetings which led to the adoption, in 1886, of the Brussels Convention for the international exchange of literary and scientific

publications, as well as for the exchange of governmental documents. The State Department requested the Smithsonian Institution to assume the responsibility of establishing in the United States a bureau of exchange to carry out the purposes of the Brussels Convention. The Board of Regents of the Smithsonian Institution agreed to accept this responsibility, and the Smithsonian Institution has continued to carry out these functions up to the present time.

The work of the International Exchange Service serves as a means of developing and executing, in part, the broad and comprehensive objective of the Smithsonian Institution, "the diffusion of knowledge." Over the years the operations of the Service have affected most beneficially the libraries of all learned institutions in the United States and have helped to promote the rapid growth of science through facilitating the international exchange of ideas. Libraries throughout the world have been enriched by the publications received through the Service from many institutions in the United States and, in turn, the libraries of the United States have benefited from the publications received from the institutions in foreign countries.

The Service operates in this manner: Libraries, scientific societies, educational institutions, and individuals in the United States who wish to transmit their publications through the Service to foreign countries, on exchange or as gifts, advise the International Exchange Service of the names and addresses of the foreign organizations to which they wish to transmit their publications, and the general character and approximate weight of the publications they wish to send. If the publications are accepted for transmission, packing and shipping instructions are furnished the sender. The transportation charges to the Smithsonian Institution must be prepaid, but there is no charge to the sender for the cost of transportation from the Smithsonian Institution to the intended addressees. Publications transmitted through the Service must be packaged and addressed by the senders.

Shipments of addressed packages of publications are received by the International Exchange Service from foreign exchange bureaus for distribution in the United States. These packages are forwarded to the domestic addressees whose names and addresses appear on the packages. Addressed packages of publications weighing 111,609 pounds were received during the past year from foreign sources for distribution in the United States.

Publications weighing 796,622 pounds were received by the International Exchange Service during the year from approximately 250 domestic sources for transmission to intended recipients in over 100 foreign countries.

Packages of publications are mailed directly to the addressees in the countries that do not have exchange bureaus. During the past fiscal

year the International Exchange Service mailed directly to the intended recipients in foreign countries addressed packages of publications weighing 225,689 pounds, or 28 percent of the total poundage received, at a cost to the Smithsonian Institution of \$51,604.18, or approximately 23 cents per pound.

The Service transmitted by ocean freight addressed packages of publications weighing 562,301 pounds, or 71 percent of the total poundage received, to foreign exchange bureaus for distribution in their respective countries. The cost to the Smithsonian Institution for forwarding these publications was \$33,843.44, or approximately 6 cents per pound. Listed below are the names of the foreign exchange bureaus to which the International Exchange Service forwards addressed packages of publications for distribution.

LIST OF EXCHANGE SERVICES

- AUSTRIA:** Austrian National Library, Vienna.
- BELGIUM:** Service des Échanges Internationaux, Bibliothèque Royale de Belgique, Bruxelles.
- CHINA:** National Central Library, Taipei, Taiwan.
- CZECHOSLOVAKIA:** Bureau of International Exchanges, University Library, Prague.
- DENMARK:** Institut Danois des Échanges Internationaux, Bibliothèque Royale, Copenhagen.
- EGYPT:** Government Press, Publications Office, Bulaq, Cairo.
- FINLAND:** Library of the Scientific Societies, Helsinki.
- FRANCE:** Service des Échanges Internationaux, Bibliothèque Nationale, Paris.
- GERMANY (Eastern):** Deutsche Staatsbibliothek, Berlin.
- GERMANY (Western):** Deutsche Forschungsgemeinschaft, Bad Godesberg.
- HUNGARY:** Service Hongrois des Échanges Internationaux, Országos Széchenyi Könyvtár, Budapest.
- INDIA:** Government Printing and Stationery Office, Bombay.
- INDONESIA:** Minister of Education, Djakarta.
- ISRAEL:** Jewish National and University Library, Jerusalem.
- ITALY:** Ufficio degli Scambi Internazionali, Ministero della Pubblica Istruzione, Rome.
- JAPAN:** Division for Interlibrary Services, National Diet Library, Tokyo.
- KOREA:** Korean Library Association, Seoul.
- NETHERLANDS:** International Exchange Bureau of the Netherlands, Royal Library, The Hague.
- NEW SOUTH WALES:** Public Library of New South Wales, Sydney.
- NEW ZEALAND:** General Assembly Library, Wellington.
- NORWAY:** Service Norvégien des Échanges Internationaux, Bibliothèque de l'Université Royale, Oslo.
- PHILIPPINES:** Bureau of Public Libraries, Department of Education, Manila.
- POLAND:** Service Polonais des Échanges Internationaux, Bibliothèque Nationale, Warsaw.
- PORTUGAL:** Serviço Português de Trocas Internacionais, Biblioteca Nacional, Lisbon.

- QUEENSLAND: Bureau of International Exchange of Publications, Chief Secretary's Office, Brisbane.
- RUMANIA: International Exchange Service, Biblioteca Centrala de Stat, Bucharest.
- SOUTH AUSTRALIA: South Australian Government Exchanges Bureau, Government Printing and Stationery Office, Adelaide.
- SPAIN: Junta de Intercambio y Adquisición de Libros y Revistas para Bibliotecas Públicas, Ministerio de Educación Nacional, Madrid.
- SWEDEN: Kungliga Biblioteket, Stockholm.
- SWITZERLAND: Service Suisse des Échanges Internationaux, Bibliothèque Centrale Fédérale, Berne.
- TASMANIA: Secretary of the Premier, Hobart.
- TURKEY: National Library, Ankara.
- UNION OF SOUTH AFRICA: Government Printing and Stationery Office, Cape Town.
- UNION OF SOVIET SOCIALIST REPUBLICS: Bureau of Book Exchange, State Lenin Library, Moscow.
- VICTORIA: State Library of Victoria, Melbourne.
- WESTERN AUSTRALIA: State Library, Perth.
- YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.

FOREIGN EXCHANGE OF GOVERNMENTAL DOCUMENTS

In accordance with treaty stipulations, conventions, and other agreements made between the United States and various foreign countries for the mutual exchange of official publications, the Smithsonian Institution transmits to the foreign recipients the official U.S. Government publications. The libraries that receive copies of all of the official publications are the recipients of the full sets of Government documents. The libraries that receive a selected list are the recipients of the partial sets of Government documents. During the fiscal year 632,922 pieces weighing 220,700 pounds were received by the Smithsonian Institution for transmission to the recipients of the full sets, and 74,951 pieces weighing 34,834 pounds were received for transmission to the recipients of the partial sets.

RECIPIENTS OF THE FULL SETS

- ARGENTINA: División Biblioteca, Ministerio de Relaciones Exteriores y Culto, Buenos Aires.
- AUSTRALIA: Commonwealth National Library, Canberra.
- NEW SOUTH WALES: Public Library of New South Wales, Sydney.
- QUEENSLAND: Parliamentary Library, Brisbane.
- SOUTH AUSTRALIA: Public Library of South Australia, Adelaide.
- TASMANIA: Parliamentary Library, Hobart.
- VICTORIA: State Library of Victoria, Melbourne.
- WESTERN AUSTRALIA: State Library, Perth.
- AUSTRIA: Administrative Library, Federal Chancellery, Vienna.
- BELGIUM: Service Belge des Échanges Internationaux, Bruxelles.²
- BRAZIL: Biblioteca Nacional, Rio de Janeiro.
- BURMA: Government Book Depot, Rangoon.

² See footnotes, p. 72.

SINGAPORE: Chief Secretary, Government Offices, Singapore.

SUDAN: Gordon Memorial College, Khartoum.

THAILAND: National Library, Bangkok.

VIETNAM: Direction des Archives et Bibliothèques Nationales, Saigon.

INTERPARLIAMENTARY EXCHANGE OF THE OFFICIAL JOURNALS

There are being sent abroad through the International Exchange Service 87 copies of the daily issues of the Federal Register and 105 copies of the daily issues of the Congressional Record. The names and addresses of the recipients of the official journals are listed below:

RECIPIENTS OF THE CONGRESSIONAL RECORD AND FEDERAL REGISTER

ARGENTINA:

Biblioteca del Poder Judicial, Mendoza.⁵

Dirección General del Boletín Oficial e Imprentas, Buenos Aires.

Cámara de Diputados Oficina de Información Parlamentaria, Buenos Aires.

AUSTRALIA:

Commonwealth National Library, Canberra.

NEW SOUTH WALES: Library of Parliament of New South Wales, Sydney.

QUEENSLAND: Chief Secretary's Office, Brisbane.

VICTORIA: State Library of Victoria, Melbourne.⁵

WESTERN AUSTRALIA: Library of Parliament of Western Australia, Perth.

BASUTOLAND: Clerk to the Legislative Council, Maseru.^{1 4}

BELGIUM: Bibliothèque du Parlement, Palais de la Nation, Brussels.⁴

BRAZIL:

Biblioteca da Câmara dos Deputados, Brasília, D.F.⁴

Secretaria da Presidência, Rio de Janeiro.⁴

BRITISH HONDURAS: Colonial Secretary, Belize.

CAMBODIA: Ministry of Information, Phnom Penh.

CAMEROON: Imprimerie Nationale, Yaoundé.^{1 5}

CANADA:

Clerk of the Senate, Houses of Parliament, Ottawa.

Library of Parliament, Ottawa.

CEYLON: Ceylon Ministry of Defense and External Affairs, Colombo.⁴

CHILE: Biblioteca del Congreso Nacional, Santiago.⁴

CHINA:

Legislative Yuan, Taipei, Taiwan.⁴

Taiwan Provincial Government, Taipei, Taiwan.

CUBA:

Biblioteca del Capitolio, Habana.

Biblioteca Pública Panamericana, Habana.⁵

CZECHOSLOVAKIA: Československa Akademie Ved, Prague.⁴

EGYPT: Ministry of Foreign Affairs, Egyptian Government, Cairo.⁴

FINLAND: Library of the Parliament, Helsinki.⁴

FRANCE:

Bibliothèque Assemblée Nationale, Paris.

Bibliothèque Conseil de la République, Paris.

Library, Organization for European Economic Cooperation, Paris.⁴

Research Department, Council of Europe, Strasbourg.⁴

Service de la Documentation Étrangère Assemblée Nationale, Paris.⁴

GABON: Secretary General, Assemblée Nationale, Libreville.^{1 4}

GERMANY :

- Amerika Institut der Universität München, München.⁴
 Archiv, Deutscher Bundestag, Bonn.
 Bibliothek des Instituts für Weltwirtschaft an der Universität Kiel,
 Kiel-Wik.
 Bibliothek Hessischer Landtag, Wiesbaden.⁴
 Deutsches Institut für Rechtswissenschaft, Potsdam-Babelsberg II.⁶
 Deutscher Bundesrat, Bonn.⁴
 Deutscher Bundestag, Bonn.⁴
 Hamburgisches Welt-Wirtschafts-Archiv, Hamburg.
 Westdeutsche Bibliothek, Marburg, Hessen.^{4,6}

GHANA : Chief Secretary's Office, Accra.⁴

GREAT BRITAIN :

- Department of Printed Books, British Museum, London.
 House of Commons Library, London.⁴
 N.P.P. Warehouse, H.M. Stationery Office, London.^{5,6}
 Printed Library of the Foreign Office, London.⁴
 Royal Institute of International Affairs, London.⁴

GREECE : Bibliothèque Chambre des Députés, Hellénique, Athens.

GUATEMALA : Biblioteca de la Asamblea Legislativa, Guatemala.

HAITI : Bibliothèque Nationale, Port-au-Prince.

HONDURAS : Biblioteca del Congreso Nacional, Tegucigalpa.

HUNGARY : Országos Széchenyi Könyvtár, Budapest.

INDIA :

- Civil Secretariat Library, Lucknow, United Provinces.⁵
 Indian Council of World Affairs, New Delhi.⁴
 Jammu and Kashmir Constituent Assembly, Srinagar.⁴
 Legislative Assembly, Government of Assam, Shillong.⁴
 Legislative Assembly Library, Lucknow, United Provinces.
 Kerala Legislature Secretariat, Trivandrum.⁴
 Madras State Legislature, Madras.⁴
 Parliament Library, New Delhi.
 Gokhale Institute of Politics and Economics, Poona.⁴

IRELAND : Dail Eireann, Dublin.

ISRAEL : Library of the Knesset, Jerusalem.

ITALY :

- Biblioteca Camera dei Deputati, Rome.
 Biblioteca del Senato della Repubblica, Rome.
 International Institute for the Unification of Private Law, Rome.⁵
 Periodicals Unit, Food and Agriculture Organization of the United Nations,
 Rome.⁵

JAPAN :

- Library of the National Diet, Tokyo.
 Ministry of Finance, Tokyo.

JORDAN : Parliament of the Hashemite Kingdom of Jordan, Amman.⁴

KOREA : Library, National Assembly, Seoul.

LUXEMBOURG : Assemblée Commune de la C.E.C.A., Luxembourg.

MEXICO :

- Dirección. General Información, Secretaría de Gobernación, Mexico, D.F.
 Biblioteca Benjamin Franklin, México, D.F.
 AGUASCALIENTES : Gobernador del Estado de Aguascalientes, Aguascalientes.
 BAJA CALIFORNIA : Gobernador del Distrito Norte, Mexicali.
 CAMPECHE : Gobernador del Estado de Campeche, Campeche.

MEXICO—Continued

- CHIAPAS: Gobernador del Estado de Chiapas, Tuxtla Gutiérrez.
 CHIHUAHUA: Gobernador del Estado de Chihuahua, Chihuahua.
 COAHUILA: Periódico Oficial del Estado de Coahuila, Palacio de Gobierno, Saltillo.
 COLIMA: Gobernador del Estado de Colima, Colima.
 GUANAJUATO: Secretaría General de Gobierno del Estado, Guanajuato.⁵
 JALISCO: Biblioteca del Estado, Guadalajara.
 MÉXICO: Gaceta del Gobierno, Toluca.
 MICHOACÁN: Secretaría General de Gobierno del Estado de Michoacán, Morelia.
 MORELOS: Palacio de Gobierno, Cuernavaca.
 NAYARIT: Gobernador de Nayarit, Tepic.
 NUEVO LEÓN: Biblioteca del Estado, Monterrey.
 OAXACA: Periódico Oficial, Palacio de Gobierno, Oaxaca.⁵
 PUEBLA: Secretaría General de Gobierno, Puebla.
 QUERÉTARO: Secretaría General de Gobierno, Sección de Archivo, Querétaro.
 SINALOA: Gobernador del Estado de Sinaloa, Culiacán.
 SONORA: Gobernador del Estado de Sonora, Hermosillo.
 TAMAULIPAS: Secretaría General de Gobierno, Victoria.
 VERACRUZ: Gobernador del Estado de Veracruz, Departamento de Gobernación y Justicia, Jalapa.
 YUCATÁN: Gobernador del Estado de Yucatán, Mérida.
- NETHERLANDS: Koninklijke Bibliotheek, The Hague.⁵
 NEW ZEALAND: General Assembly Library, Wellington.
 NIGERIA: Office of the Clerk of the Legislature, Enugu.^{3 4}
 NORWAY: Library of the Norwegian Parliament, Oslo.
 PAKISTAN: Secretary, Provincial Assembly West Pakistan, Lahore.^{3 4}
 PANAMA: Biblioteca Nacional, Panama City.⁴
 PHILIPPINES: House of Representatives, Manila.
 POLAND: Kancelaria Rady Panstwa, Biblioteka Sejmowa, Warsaw.
 PORTUGUESE TIMOR: Repartição Central de Administração Civil, Dili.⁵
 RHODESIA AND NYASALAND: Federal Assembly, Salisbury.⁵
 RUMANIA: Biblioteca Centrala de Stat RPR, Bucharest.
 SPAIN: Boletín Oficial del Estado, Presidencia del Gobierno, Madrid.⁵
 SWEDEN: Universitetsbiblioteket, Uppsala.⁴
 SWITZERLAND:
 International Labour Office, Geneva.^{5 7}
 Library, United Nations, Geneva.
- TANGANYIKA: Library, University College, Dar es Salaam.^{1 4}
 TOGO: Ministère d'État, de l'Interieur, de l'Information et de la Presse, Lome.
 UNION OF SOUTH AFRICA:
 CAPE OF GOOD HOPE: Library of Parliament, Cape Town.
 TRANSVAAL: State Library, Pretoria.
- UNION OF SOVIET SOCIALIST REPUBLICS: Fundamental'nii Biblioteka Obshchestvennykh Nauk, Moscow.
 URUGUAY: Diario Oficial, Calle Florida 1178, Montevideo.
 YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.⁷

¹ Added during the year.² Receives two sets.³ Change in name.⁴ Congressional Record only.⁵ Federal Register only.⁶ Three copies.⁷ Two copies.

The International Exchange Service accepts publications for transmission to addressees in all countries except to the mainland of China, North Korea, and Communist-controlled areas of Vietnam but will not accept packages of publications from domestic sources intended for addressees in the United States or in a territory subject to the jurisdiction of the United States.

The number and weight of the packages received from sources in the United States for transmission abroad, and the number and weight of packages received from foreign sources intended for domestic addressees, are classified in the accompanying table.

Classification	Received by the Smithsonian Institution for transmission			
	For transmission abroad		For distribution in the United States	
	Number of packages	Weight in pounds	Number of packages	Weight in pounds
U.S. parliamentary documents received for transmission abroad.....	715, 347	287, 664	-----	-----
Publications received from foreign sources for U.S. parliamentary addressees.....	-----	-----	12, 568	14, 124
U.S. departmental documents received for transmission abroad.....	235, 396	253, 131	-----	-----
Publications received from foreign sources for U.S. departmental addressees.....	-----	-----	4, 553	12, 090
Miscellaneous scientific and literary publications received for transmission abroad.....	191, 187	255, 827	-----	-----
Miscellaneous scientific and literary publications received from abroad for distribution in the United States.....	-----	-----	47, 069	85, 395
Total.....	1, 141, 930	796, 622	64, 190	111, 609
Total packages received.....	1, 206, 120	-----	-----	-----
Total pounds received.....	-----	-----	-----	908, 231

Respectfully submitted.

J. A. COLLINS, *Chief.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the Bureau of American Ethnology

SIR: I have the honor to submit the following report on the field researches, office work, and other operations of the Bureau of American Ethnology during the fiscal year ended June 30, 1963, conducted in accordance with the act of Congress of April 10, 1928, as amended August 22, 1949, which directs the Bureau "to continue independently or in cooperation anthropological researches among the American Indians and the natives of lands under the jurisdiction or protection of the United States and the excavation and preservation of archeologic remains."

SYSTEMATIC RESEARCHES

Dr. Frank H. H. Roberts, Jr., director of the Bureau, devoted most of the fiscal year to office duties and to general supervision of the activities of the Bureau and the River Basin Surveys.

Early in August, at the invitation of the Czechoslovak Academy of Sciences, Dr. Henry B. Collins, anthropologist, attended a meeting of the Permanent Council of the International Congress of Anthropological and Ethnological Sciences in Prague. Following the meetings the delegates were taken on a week's tour to visit ethnographic museums and inspect paleolithic and neolithic sites being excavated by Czech archeologists in Bohemia, Moravia, and Slovakia.

On November 9-10 Dr. Collins participated in a symposium on Prehistoric Man in the New World held at Rice University, Houston, Tex., in celebration of the 50th anniversary of the university. His paper, discussing the present status and problems of archeological research in the American Arctic and subarctic, together with those of the 16 other participants in the symposium, will appear in a volume to be published by the University of Chicago Press. Dr. Collins's paper "Bering Strait to Greenland," evaluating the results of recent archeological discoveries in the American Arctic and their bearing on the problem of the origin and relationships of Eskimo culture, was published in December 1962 in *Technical Paper No. 11, Arctic Institute of North America*. Another paper, "Stefansson as an Anthropologist," was published in the Stefansson memorial issue of *Polar Notes, No. 4*.

In December Dr. Collins was reelected to a 3-year term on the board of governors of the Arctic Institute of North America. He continued

to serve as a member of the Institute's publications committee and as chairman of the directing committee which is responsible for preparation of the *Arctic Bibliography*, a reference work which summarizes and indexes the contents of scientific publications in all fields, and in all languages, pertaining to the Arctic and subarctic regions of the world. The material for Volume 11 of the bibliography, edited by Marie Tremaine, was delivered to the Government Printing Office in October 1962. Approximately 1,500 pages in size, it will contain abstracts in English of 6,607 publications, of which 2,990 are of books, monographs, and papers published in Russian, 2,638 in English, and 979 in Scandinavian, German, French, and other languages. American scientists and others interested in following the course of scientific research and economic and social developments in the northern parts of the Soviet Union find the bibliography a valuable source of information, including as it does English abstracts of Soviet publications on such widely varied subjects as acclimatization, acculturation, administration and government, aerial mapping and reconnaissance, agriculture, archeology, botany and zoology, construction, economic conditions, education, electric power, fishes and fisheries, forestry, geology and geophysics, hydrology, ice navigation, maps and mapping, meteorology, mineral resources, mines and mining, oceanography, paleontology, public health and medicine, petroleum, petrology, railroads, transportation, wildlife conservation and management, etc. Abstracts of anthropological publications have formed a substantial part of the *Arctic Bibliography* from the beginning of the project. An attempt has been made, with considerable success, to summarize and index the contents of every paper that has been written on the Eskimos of Siberia, Alaska, Canada, and Greenland; the Tlingit, Haida, and Tsimshian Indians of the Northwest Coast; the northern Athapaskans and Algonkians; and the native peoples of northern Eurasia.

The Arctic Institute's Russian translation project—*Anthropology of the North: Translations from Russian Sources*—which Dr. Collins organized in 1960, continued its operations under a renewed grant from the National Science Foundation and the editorship of Dr. Henry N. Michael. The third volume of the series, an English translation of the late M. G. Levin's definitive work on the anthropology of northeastern Asia (*Ethnic Origins of the Peoples of Northeastern Asia*), was published by the University of Toronto Press in May 1963. Additional translations of Russian publications on Arctic anthropology are in the course of preparation.

Dr. William C. Sturtevant attended the 35th International Congress of Americanists (Mexico City, August 19-25), the joint annual meetings of the American Indian Ethnohistoric Conference and the Conference on Iroquois Research (Albany, October 12-14), the 61st annual

meeting of the American Anthropological Association (Chicago, November 15-18), and the annual meeting of the Central States Anthropological Society (Detroit, May 16-18). At the last he participated in a symposium on primitive art.

Dr. Sturtevant's time in Washington was devoted to continuing research on the Iroquois and Seminole, to preparation of a paper titled "Studies in Ethnoscience" which he presented at the Social Science Research Council's Conference on Transcultural Studies of Cognitive Systems (Mérida, Yucatán, April 17-20), and to his duties as book-review editor of the *American Anthropologist*. Papers by him were published in the *Florida Anthropologist* and in *Ethnohistory*.

In July Dr. Sturtevant spent about 2 weeks continuing ethnographic fieldwork among the Seneca-Cayuga of Oklahoma, which he had begun the previous summer. This research, supported by a grant from the American Philosophical Society, is providing data on the most extreme variant of Iroquois culture, particularly on religion and ceremonial aspects, which casts a new light on the relatively well-known culture of the modern Iroquois communities in New York and Ontario. In October Dr. Sturtevant spent a few days on the Six Nations Reserve in Ontario, observing an important Iroquois religious ceremony and making inquiries for comparison with his Oklahoma data. In addition to this fieldwork, Dr. Sturtevant conducted archival research on the Oklahoma Seneca-Cayuga in the Indian Archives Division of the Oklahoma Historical Society in Oklahoma City (July 23-24) and museum research on Florida Seminole and other eastern Indian material in the Milwaukee Public Museum (November 19-21) and in the College Museum of Hampton Institute, Hampton, Va. (June 8-9).

In November Dr. Robert M. Laughlin, ethnologist, began fieldwork in Chiapas, Mexico, where he collected and recorded ethnographic and linguistic materials, particularly myths and dreams, as well as numerous prayers, from the Tzotzil Indians of Zinacantan, Chiapas, and surrounding areas. A vocabulary of 2,200 items of the dialect of Zinacantan collected by Lore M. Colby in 1960 has been expanded to 4,000 by Dr. Laughlin. He recorded a series of 26 dreams in Tzotzil from a Zinacantan informant. Because specific dream experiences determine the selection of shamans from the community and also provoke new religious feasts, it is expected that dreams will illuminate many aspects of Zinacantan world view. This material is being prepared for publication.

Dr. Laughlin utilized the results of a week of ethnographic research in the Huastec area of the States of San Luis Potosí and Veracruz, Mexico, in January 1963, to supplement library research for the preparation of the chapter "Huastec" for the *Handbook of*

Middle American Indians. Another chapter for the *Handbook*, entitled "Tzotzil," is in preparation. Dr. Laughlin returned to Washington in mid-May to check on data he had obtained in the field and to consult references in various libraries, and on June 14 left again for Mexico to continue his field studies.

RIVER BASIN SURVEYS

The River Basin Surveys, the unit of the Bureau of American Ethnology organized to cooperate with the National Park Service and the Bureau of Reclamation of the Department of the Interior, the Corps of Engineers of the Department of the Army, and State and local institutions in the program for salvage archeology in areas to be flooded or otherwise destroyed by the construction of large dams, continued its activities. An increase in funds made possible an expansion of the program throughout the Missouri Basin. The investigations during 1962-63 were supported by a transfer of \$271,000 from the National Park Service, a carryover of \$64,498 Missouri Basin money, a grant of \$7,285 from the Appalachian Power Co., and a carryover of \$4,080 from an earlier contribution by the Idaho Power Co. The National Park Service funds were to support the investigations in the Missouri Basin, and the grant from the Appalachian Power Co. was to provide for archeological excavations along the Roanoke River in southern Virginia where the Smith Mountain Project is nearing completion. The balance from the Idaho Power Co. came from a grant originally made to conduct researches in the Hells Canyon Reservoir area along the Snake River, Idaho-Oregon, and the work this year was a continuation of that project. This particular investigation was carried on as a cooperative project between the River Basin Surveys and the Museum of Idaho State College at Pocatello. The grand total of funds available for the River Basin Surveys in 1962-63 was \$346,863.

Activities in the field pertained, in large part, to surveys and excavations. Most of the work was concentrated in the digging or testing of sites but surveys were made in six new reservoir basins. Five of the new reservoirs were in Kansas; the sixth was in Nebraska. At the beginning of the fiscal year, nine excavating parties were in the field in the Missouri Basin and one survey party was operating in Montana. In September, digging was started in the Smith Mountain Reservoir area in southern Virginia, and in October a small group collected pollen samples from areas in western Nebraska. During February and early March one party excavated a site along the Chattahoochee River in Georgia. In May, a small group worked for a short period in South Dakota, while another made the reconnaissance of the six reservoirs previously mentioned. Also during May a party

returned to the Smith Mountain area. During June, 11 parties began operations in the Missouri Basin and were fully occupied in the excavation program at the end of the fiscal year.

As of June 30, 1963, archeological surveys and excavations had been made, since the start of the salvage program, in a total of 264 reservoir areas located in 29 different States. Furthermore, two lock projects, four canal areas, and two watershed areas had also been examined. Since 1946, when the program got underway, 5,009 sites have been located and recorded; of that number, 1,175 were recommended for excavation or limited testing. Because of the conditions under which the salvage operations need to be conducted, complete excavations, except in the case of a few small sites, are rarely possible. Consequently, when the term "excavation" is used, it generally implies that only about 10 percent of a site was dug.

By the end of the year, 484 sites in 54 reservoir basins and one watershed area had either been tested or excavated to the degree where good information about them had been obtained. It has been the policy of the River Basin Surveys to dig in at least one example of the various kinds of sites reported in the preliminary surveys. The sites range in nature from those which were simple camping areas, occupied by early hunting and gathering Indians of about 10,000 years ago, to village remains left by historic Indians of the mid-19th century. In addition, the remains of frontier trading posts of European origin and of Army installations have also been examined. The results of the investigations have been incorporated in reports which have been published in various scientific journals, in the Bureau of American Ethnology Bulletins, and in the Miscellaneous Collections of the Smithsonian Institution. *River Basin Surveys Paper No. 25*, which constitutes *Bureau Bulletin 182*, pertaining to the work done in the John H. Kerr Reservoir Basin on the Roanoke River, Virginia-North Carolina, was published in October. *River Basin Surveys Papers Nos. 26-32*, which report on investigations in North Dakota, Montana, and Kansas, and comprise *Bulletin 185*, were released during June. Reports on other investigations in the two Dakotas and Kansas, consisting of *River Basin Surveys Papers 33-38*, constituting *Bulletin 189*, were sent to the Printing Office early in the fiscal year and will be ready for distribution shortly after the beginning of the new year. Various members of the staff cooperated with representatives of other Federal agencies in the preparation of short popular pamphlets about some of the major reservoir projects. These pamphlets were published by the cooperating agency and are distributed at the visitors' center for the reservoir concerned.

As in previous years, the River Basin Surveys received helpful cooperation from the National Park Service, the Bureau of Reclama-

tion, the Corps of Engineers, the Geological Survey, and numerous State and local institutions. The party leaders were assisted in many ways by the field personnel of all the cooperating agencies, and the relationship was excellent in all areas. The National Park Service continued to serve as liaison between the various agencies, both in Washington and in the field. The Park Service also prepared the budget estimates and justifications for the funds needed to support the salvage program.

General direction and supervision of the program were continued by the main office in Washington. Work in the Missouri Basin was directed by the field headquarters and laboratory at Lincoln, Nebr. The projects in southern Virginia and Georgia were supervised by the Washington office.

Washington Office.—Dr. Frank H. H. Roberts, Jr., continued the direction of the main headquarters of the River Basin Surveys in the Bureau of American Ethnology throughout the year. Harold A. Huscher and Carl F. Miller, archeologists, were based at that office. Mr. Huscher had just returned from the Walter F. George Dam and Lock area on the Chattahoochee River below Columbus, Ga., at the beginning of the fiscal year. He remained in the office during the summer and fall months, working on the accumulating records and collections from the 4 preceding years. In November he attended the Southeastern Archeological Conference and the Conference on Historic Site Archeology at Mound State Park, Moundville, Ala., reading a report on the "Archaic of the Walter F. George Reservoir Area." On November 10 and 11, he attended the Eastern States Archeological Conference at Athens, Ga., reading a paper on "Generic Western Names Identifiable in the Southeast." On November 22-24, he participated in the 20th Annual Plains Conference at Lincoln, Nebr., where he discussed "Southern Athapaskan Names in Early Spanish Records." Early in February he returned to Georgia and completed emergency excavations at a site just south of the City of Columbus. In May he attended the joint meeting of the Society for American Archeology and the American Association of Physical Anthropologists at Boulder, Colo., reading a paper on "Intermontane Athapaskan Continuities." At the close of the fiscal year he was working on his materials from the Walter F. George Reservoir area.

At the beginning of the fiscal year Mr. Miller was in charge of an excavating party at the Tuttle Creek Reservoir area in northern Kansas. The results of his activities there are covered in the following section on the Missouri Basin. On September 10 he left for the Smith Mountain and Leesville Reservoir area in southern Virginia and carried on excavations there until November 18, when weather conditions made it advisable to terminate digging until spring.

While in the Washington office he worked on materials he had previously collected in Georgia and also started detailed studies on the ceramic material he had obtained while digging at Russell Cave in Alabama. He also examined numerous archeological specimens sent to the Washington office by private collectors. In January he assisted in setting up a series of archeological exhibits at one of the schools in Newport News, Va. He also completed two short papers for publication, one describing certain polyhedral cores found in Kansas, the other discussing *Chenopodium* weeds as a source of food for Southeastern Indians. On May 15, Mr. Miller left Washington for Rocky Mount, Va., to resume his investigations in the Smith Mountain Reservoir Project area, and at the end of the year he and his small field party were digging in one of the best sites found in that locality.

Alabama-Georgia.—Harold A. Huscher spent the week of November 4-10 at the Walter F. George Reservoir, checking and photographing sites as they were being progressively flooded by the rising waters of the reservoir. At the upper end of the reservoir the historically important Coweta Town House site, 1 RU 9, where Oglethorpe held a peace conference with the Creek chiefs in 1739, was being destroyed by grading for the new Phoenix City dock development.

The Walker Street site (Key School site), 9 ME 60, reported by David W. Chase, Fort Benning Infantry Museum, was being destroyed by an eroding drainage ditch and immediate salvage operations were recommended. Huscher returned to Georgia on February 7, 1963, and, working under an emergency grant, investigated this site, which proved to be an Early Woodland occupation level buried in a natural levee of the Chattahoochee River south of Columbus. With the assistance of David W. Chase of the Infantry Museum, power equipment was used in stripping the overburden from 1,600 square feet of the site. The exposed camp layers were then excavated using power-screening techniques. Post holes in linear and curvilinear arrangements were recorded, but no complete house patterns were worked out. Twenty occupational features, including pits and hearths, were recorded. Over 3,000 sherds and stone artifacts were recovered, of which 1,000 were sherds of the sand-tempered fine-checked (Cartersville Check Stamped) types. There were 40 examples of the tetrapodal pot-base and 9 examples of the subrectangular flat pot-base, characteristic of the late Deptford Period. Minority pottery types were, in descending frequency, large check stamped, complicated stamped, linear check stamped, and simple stamped. A few sherds showed combinations of check stamped and complicated stamped, possibly transitional Deptford-Swift Creek forms belonging with Willey's New River Complicated Stamped. The characteristic

point is triangular, thick cross-section, slightly excurvate sides, with baseline either straight, slightly concave, or slightly convex. The assemblage, seemingly a manifestation late in the Deptford Period, with some early traits of the Swift Creek complex appearing, most closely parallels that found in the submound and primary mounds at the Stark's Clay Landing site, 9 CLA 1 ("Mandeville Mound," University of Georgia), and the Mound at the Upper Francis Landing, 1 BR 15 ("Shorter Site," University of Alabama), and the Early Woodland level at the Russell Cave.

Idaho-Oregon.—Under an agreement with the Smithsonian Institution, the Idaho State University Museum undertook archeological reconnaissance and excavations in the Hells Canyon Reservoir on the Snake River between Idaho and Oregon. Fieldwork began on March 25, 1963, and concluded June 20, 1963. The project was under the general supervision of Dr. Earl H. Swanson, director of the museum. Max G. Pavesic, a graduate student at the University of Colorado, directed the fieldwork and was assisted by Roger Nance, Washington State University, and by David Wyatt, University of Washington.

Field headquarters were maintained at Oxbow Dam, where the Idaho Power Co. generously made available a trailer for residence and for laboratory work. Additional assistance during the excavation was given by the Morrison-Knudsen Corp., which provided the field party with a bulldozer. Grateful acknowledgment is also due to Jess Smith, Mr. and Mrs. Amos Camp, Dan Cole, Ross Parker, Ralph Page, and Rudy Lanning for the help they gave.

The field studies were conducted throughout by three men whose work included intensive reconnaissance and excavation at an important village site (No. 10-AM-1). Ten archeological sites were located which were not reported in the original survey of Hells Canyon (Columbia Basin Project, River Basin Surveys, Smithsonian Institution, 1951). These include three rockshelters, seven camp sites, and numerous rock cairns. Five cairns were excavated. The first was excavated entirely by hand because these appear to be a type of archeological feature. Cairns of this nature are constructed of large boulders, which sometimes weigh several tons and which are covered by earth. Reports of burials beneath the cairns were given to the crew, but no archeological materials or data were obtained from them and they remain unexplained at this time.

An important village site was given careful attention by the field party. Two adjacent housepits, as well as the area between, were intensively examined by excavation. These lie on a north-south axis parallel to the river. The largest structure is approximately 25 feet in diameter, while the smaller measures approximately 12 feet across.

It could not be determined whether there was any superimposition of the structures. Stratigraphically, and by the artifact inventory, the housepits appear to be contemporaneous. In both, the house fill is not more than 3½ feet in depth. Little soil change was found in the fill, which was a dark loam near the top but became sandier with depth. Above the sterile soil, yellow sand and gravel, an ash layer is found throughout the limits of the housepits. Stratigraphically, there appears to be only one cultural occupation.

Large quantities of tools, flakes, and bones were recovered, which indicate both intensive occupation and use of the area for hunting purposes. Preliminary examination of the artifacts suggests that occupation was late in prehistoric time, possibly early historic, and similarities can be seen with the Camas Prairie Phase reported at the Weis Rockshelter on Camas Prairie (B. Robert Butler, Contributions to the Prehistory of the Columbia Plateau, *Occasional Papers No. 9* of the Idaho College Museum).

Missouri Basin.—At the beginning of fiscal year 1947 the Missouri Basin Project of the River Basin Surveys began its operations from the field headquarters and laboratory in Lincoln, Nebr. The Project has carried on its activities for 17 consecutive years from that location. The office and laboratory were at first housed with the Laboratory of Anthropology in the basement of the Social Sciences Building. They were then moved to a basement hallway of the University of Nebraska Library. Shortly thereafter much more space was made available in the basement of the just-completed Burnett Hall on the University campus, and the Laboratory of Anthropology and the project again joined forces. By 1950, both the project and the Laboratory of Anthropology had outgrown this space, and the Missouri Basin Project rented a building at 1517 O Street. The project laboratory was transferred to the new location, but offices were maintained in Burnett Hall. In 1953 the offices were moved to O Street and the entire project operated from that location for the following 10 years. During the present fiscal year expansion of the project and deterioration of the upper floors of the building at 1517 O Street made new quarters an absolute necessity. On May 1, 1963, the Missouri Basin Project rented a one-story building at 1835 P Street in Lincoln and moved to that location. It is a relatively new, fireproof building of 14,000 square feet, with all laboratory, storage, and office facilities on one floor.

Activities during the current fiscal year, as in past years, included surveys, excavations, analyses of materials, and reporting of results of the salvage of archeological remains being destroyed by dam and reservoir construction within the Missouri Basin. Dr. Robert L. Stephenson served as chief of the project, except for approximately 3 months when he was on leave and Dr. Warren W. Caldwell func-

tioned as acting chief. During the summer months the work consisted mainly of excavations. Analyses and preparation of reports received the major attention throughout the remainder of the year. The special chronology program, begun in January 1958, was continued throughout fiscal 1963.

At the beginning of the year the permanent staff, in addition to the chief, consisted of five archeologists, one administrative clerk, one administrative assistant, one secretary, one clerk-typist, one scientific illustrator, one photographer, and four museum aides. The temporary staff included 4 archeologists, 5 field assistants, 3 cooks, and 83 field crewmen.

During July and August seven field crewmen were added to the temporary staff. By the end of the first week in August, the employment of all the field crewmen and cooks had been terminated. Other terminations of temporary employees were made shortly thereafter. Four of the temporary archeologists and field assistants were transferred to the permanent staff as archeologists.

At the end of the fiscal year the permanent staff consisted of 21 persons. These were, in addition to the chief, nine archeologists, one administrative assistant, one secretary, one administrative clerk, two clerk-typists, one scientific illustrator, one photographer, and four museum aides. The temporary staff consisted of 71 persons: 3 archeologists, 2 physical anthropologists, 4 cooks, and 62 field crewmen.

During the year there were 25 Smithsonian Institution River Basin Surveys field parties at work in the Missouri Basin. During July and August four parties were working in the Oahe Reservoir area and four parties were working in the Big Bend Reservoir area of South Dakota; two parties were working in the Yellowtail Reservoir area of Montana and Wyoming; one crew was working in the Tuttle Creek Reservoir area in Kansas; and one party was surveying the Missouri Breaks area between Fort Peck and Fort Benton in Montana. In October a small crew was collecting pollen samples in western Nebraska. In May, a small crew worked in the Fort Randall Reservoir area of South Dakota and a survey party conducted a reconnaissance of six proposed reservoirs in Kansas and Nebraska. During June, a crew was excavating in the Pony Creek area of Iowa; another crew had begun work on the James Diversion Project in South Dakota; one crew was at work in the Yellowtail Reservoir of Montana and Wyoming; three parties were working in the Oahe Reservoir; and four groups were excavating in the Big Bend Reservoir, South Dakota. One special crew was not in the field but was at work during June in the laboratory at Lawrence, Kans., studying the skeletal remains from sites in the Oahe Reservoir.

Other fieldwork in the Missouri Basin during the year included 14 parties from State institutions operating under cooperative agreements with the National Park Service and in cooperation with the Smithsonian Institution in the Inter-Agency Archeological Salvage Program.

At the beginning of the year Robert W. Neuman, assisted by John J. Hoffman and a crew of 10, was at work on the excavation of an early village of circular houses known as the Molstad site (39DW234),¹ about 8 miles south of Mobridge, S. Dak., on the right bank of the Missouri River in Dewey County. This site will be subject to wave cutting at maximum pool level of the Oahe Reservoir. Artifacts and architectural details recovered indicate that the site had been a small, fortified village of the very early period of circular house occupation often referred to as the La Roche. There were five houses within an oval stockade and one larger house outside the stockade. The stockade was surrounded by a dry moat 2.6 feet deep and had a single large loop bastion on one side. The entire stockade line and five of the houses were excavated, as well as the bastion and two cross sections of the moat. The people who occupied this site during the 15th or 16th centuries were culturally very closely related to those who occupied the Potts Village, some 2 miles upstream, which had been excavated previously by crews from the Missouri Basin Project.

A second field party in the Oahe Reservoir, also directed by Robert W. Neuman with the assistance of James J. Stanek and a crew of 10, was at work at the beginning of the year excavating the Swift Bird site (39DW233), half a mile downstream from the Molstad site. This site comprised a group of two burial mounds of the Plains Woodland Period and a circular house depression that appears to belong to the La Roche Period. The burial mounds date from a period of some 1,500 or so years ago, while the house dates from about 500 years ago. Mound 1 was a dome-shaped tumulus 75 feet in diameter and 4 feet high. Several articulated bison skeletons lay on the mound floor as did numerous large, charred timbers. Below these was a burial pit containing several secondary human interments. Artifacts were few and largely found within the burial pit. In most respects this mound resembled those excavated at the Boundary Mounds site at the North Dakota-South Dakota State line. Mound 2 was slightly smaller and had articulated bison skeletons, secondary

¹ Site designations used by the River Basin Surveys are trinomial in character, consisting of symbols for State, county, and site. The State is indicated by the first number, according to the numerical position of the State name in an alphabetical list of the United States; thus, for example, 32 indicates North Dakota, 39 indicates South Dakota. Counties are designated by a two-letter abbreviation; for example, ME for Mercer County, MN for Mountrail County, etc. The final number refers to the specific site within the indicated State and county.



Walker Street site (Key School site), 9ME60, a buried Deptford camp on the Chattahoochee River, Ga. Overburden has been removed and the underlying camp levels are being excavated by units 10 feet square. River Basin Surveys.



Probable house pattern showing at bottom of Deptford level. Shown here are indications of a subrectangular structure with supporting wall posts set in trenches. River Basin Surveys.



Close-up view of the Sorenson site (24CB202) in the Big Horn Canyon within the Yellowtail Reservoir area during excavation. Evidence of more than 7,000 years of occupation were uncovered in this small rock shelter. River Basin Surveys.



View of the site (24CB203) at the confluence of Dry Head Creek with the Big Horn River within the Yellowtail Reservoir area. Smithsonian Institution field camp can be seen adjacent to the excavation area. River Basin Surveys.

human burials, and a very few artifacts on the mound floor, but no burial pit. The circular house provided a minimal floor pattern without center posts and a small quantity of artifacts. This party also excavated Mound 3 of a series of five burial mounds at the Grover Hand site (39DW240). That mound resembled Mound 1 at the Swift Bird site, including the burial pit. Remains of 17 bison were recovered from the mound fill and floor. A new site, the Stelzer (39DW242), was tested. It is situated about a mile downstream from 39DW240. Occupational levels and artifacts indicate that this may be a substantial camp site of Plains Woodland times. Neuman's two crews shared a single camp and completed their fieldwork on September 2 after 12 weeks in the field.

A third field crew in the Oahe Reservoir was directed by Dr. William M. Bass, assisted by Jon Muller and a crew of six. Based in Pierre, this party utilized a caterpillar tractor and scraper to excavate large sections of the burial areas at the Sully site (39SL4), which is located approximately 20 miles northwest of Pierre, on the left bank of the Missouri River. It comprises the largest prehistoric village remains in the Missouri Basin and was excavated in previous years by Smithsonian Institution field crews. The large burial areas were not exhausted and, in order to get a sufficiently large sample of the physical remains of the people who had lived there some 250-400 years ago, the current season's work was directed toward exhausting the burial areas. The heavy equipment was used to remove the overburden above the graves. Each grave was then excavated by hand. During the first three seasons of work, 264 burials were excavated. This season an additional 293 were recovered, making a total of 557 burials from this one village. Brief investigations at other sites provided additional burials. At the Swan Creek site (39PO1), excavated during a previous season by a cooperating institution, a single burial was obtained. At the Bleached Bone site (39HU48), 20 burials were recovered and 8 were taken from the Second Hand site (39PO207). In addition, a good quantity of burial artifacts was recovered, correlating the burials directly with the village areas and providing cultural meaning for the skeletal remains. This party completed its fieldwork on August 30 after a season of 12 weeks.

The fourth Oahe Reservoir party was directed by Dr. Alfred W. Bowers, assisted by William B. Colvin and a crew of 10. Based at Mobridge, S. Dak., this crew excavated 14 circular earth lodges in the Red Horse site (39CO34) just west of the bridge from Mobridge and at the mouth of the Grand River. This was a moderately large, fortified earth-lodge village of the late period and probably dates in the 18th century. A large artifact yield as well as good architectural details resulted from the excavations. Bowers's crew also exca-

vated a portion of the Davis site (39CO14), some 200 yards west of the Red Horse site. There, a complex defensive system and a series of long rectangular houses were partly uncovered. Apparently there were at least two, and perhaps three, occupation periods represented, but time did not permit sufficient excavation to recover the whole story. The earliest occupation of the Davis site was several centuries earlier than that at the Red Horse site. Continuation of the work was planned for the next season.

In the Big Bend Reservoir area, three field parties were at work at the beginning of the year and a fourth party was added during July. One of the parties was directed by Dr. Warren W. Caldwell, assisted by Richard E. Jensen and a crew of 11. They excavated at two sites. The Langdeau site (39LM209) had been a village of long-rectangular houses and 15 depressions were visible. Four of these house remains were excavated, and three long trenches were dug in an unsuccessful attempt to find a fortification system. The houses were 30-40 feet wide with no small structural posts at the ends. Entrances were to the south or southwest and floors were compact and stained with red ochre. Pottery found there is of the Anderson and Foreman types, suggesting relationship to the early rectangular-house period at the Dodd site near Pierre, but other artifacts were extremely exotic, including copper, shell, bone, and stone tools and ornaments. This crew's second excavation was at the Jiggs Thompson site (39LM208), located 9 miles north of Lower Brule in the loop of the Big Bend. This site had been a small village of 17 long-rectangular houses situated on a high terrace finger that was separated from the rest of the terrace by a moat 4.5 feet deep and 11 feet wide. Two houses were excavated, the moat was sampled, and numerous other test trenches were dug. The houses had been about 30 by 20 feet with entrances to the south. They did not have end posts, but there were massive central support posts. Architecture and artifacts suggest a close relationship to the Langdeau site; both are in the Anderson-Foreman and Swanson traditions of early rectangular-house culture. This party completed its work on August 26 after 11 weeks in the field.

The second Big Bend party was also directed by Dr. Caldwell, with the assistance of Richard E. Carter. It consisted of a crew of nine. Excavations were carried out at a two-component site (39LM2) overlooking Medicine Creek some 8 miles northwest of Lower Brule. This had been a village of small, rectangular houses with ramp entrances to the south, minimal end support posts, and many cache pits. The remains of the first occupation were overlain by those of a village of square (or subrectangular) houses, 35 feet in diameter, which had four central support posts of the kind usually found in

late circular houses in the area. One house of each component, many cache pits, and several midden areas were excavated. Abundant pottery and other artifacts suggest that the earlier component relates to the Anderson and Over foci, while the later component was of the period of the Shannon Focus and similar to component C at the Talking Crow site. This party also sampled the Jandreau site (39LM221), 3 miles east of Medicine Creek in the same general area. Portions of two long-rectangular houses were excavated as were cross sections of the fortification moat. Ceramics recovered there suggest that the village may have been transitional between the Anderson Focus and the Thomas Riggs Focus and will date toward the latter part of the long-rectangular house period. In addition, minor tests were made at the Gilman site (39LM226) and at site 39LM228 in the Medicine Creek Bottoms. The latter proved to have been a rectangular-house village of Over Focus affiliation, while the former was a circular-house village of the Shannon Focus. After 11 weeks in the field this crew completed its assignment on August 26.

A third party in the Big Bend Reservoir area, sharing a joint camp with Caldwell's two crews, was directed by Vernon R. Helmen. This crew of three was frequently assisted by members of Caldwell's parties during the 2 weeks of its work (July 16-27). Helmen and his associates provided their services on a volunteer basis, and Mrs. Helmen made a useful study of the microecology of the flora of one earth lodge. The Helmen crew excavated one house in site 39LM223, a small village of the Shannon Focus. The circular house and several cache pits yielded Talking Crow and Iona pottery.

The remaining field party in the Big Bend Reservoir area was at work at the beginning of the year excavating the remains of Fort George (39ST202), a historic fur-trading post built in 1842 and operated briefly in opposition to the trading post of Fort Pierre Chouteau. The crew of eight was directed by G. Hubert Smith, assisted by Lee G. Madison, and was based in Pierre with the Bass party. Fort George was located on the right bank of the Missouri River some 15 miles downstream from Pierre. Remains of the log stockade, two blockhouses, and the interior buildings of timber were excavated and recorded. Artifacts were abundant and will, along with the architecture, provide a substantial picture of life at this early post, of which so little contemporary record remains.

Two Missouri Basin Project field parties were at work at the beginning of the year in the Yellowtail Reservoir area in the Big Horn Canyon in Montana and Wyoming. Lionel A. Brown, with a crew of five, operated in the lower end of the reservoir from the Yellowtail Dam south to the mouth of Dry Head Creek, a distance of some 25 miles upstream from the dam. They excavated three large, dif-

fuse, occupation sites and tested numerous rock shelters. Site 24BH215 at the mouth of Black Canyon, 6 miles above the dam, was a stratified campsite with three levels of occupation. Artifacts were moderately abundant and included a few nondescript potsherds, corner-notched projectile points, and many scrapers, blades, and bone tools, but no evidence of structures. It appears to have been a camp intermittently occupied from a few hundred years ago to historic times. Site 24BH212 was a complex of occupations at the mouth of Bull Elk Canyon 18 miles above the dam. It contained six stone circles, two circles of shallow postholes, midden deposits, fireplaces, a profusion of scrapers and other small stone tools but very few projectile points and no evidence of pottery. Five of the stone circles contained semicompacted floors, floor debris, and a central fireplace, and one had a midden deposit just outside the stone circle all emphasizing the fact that they served the function of actual tipi rings. The circular arrangements of shallow postholes with a suggestion of floors indicate structures of temporary pole construction. Occupation was shallow with only one level apparent except in one small section of the site where three levels were apparent. Artifacts are not very diagnostic but probably represent a period of three or four centuries before White contact. The third major site excavated by Brown's crew was located on the opposite (left) bank of the Big Horn River at the mouth of Dry Head Creek some 25 miles above the dam. There, four levels of occupation produced large quantities of bison, deer, and elk bone, numerous small stone artifacts, an elk bone flesher, numerous fire pits, and basin-shaped pits but neither pottery nor structures. Several rock shelters between Black Canyon and Dry Head were investigated and tested but none proved to contain worthwhile occupational materials. This party returned to the Lincoln headquarters August 31 after 11 weeks in the field.

Wilfred M. Husted was in charge of the second Yellowtail field party excavating a series of sites in the upper reaches of the reservoir. Working from various campsites between the village of Kane at the extreme southern end of the reservoir to Barry's Landing, some 20 miles to the north, this crew used boat, Jeep, carryall, and foot transportation to resurvey this portion of the Big Horn Canyon and excavate five sites. A rock shelter (48BH206) was sampled but not completed owing to difficulty of access. A large tipi ring site (48BH10) with 20 stone circles, on the left bank of Crooked Creek, was excavated. Five of the circles were dug and three of them contained central fireplaces as well as exterior fireplaces. One open campsite (48BH211) and several rock shelters were examined and tested but provided no useful archeological data. On the Wyoming side of the reservoir, a site at Barry's Landing (24CB201) was exca-

vated. It had superimposed hearths and roasting pits and numerous projectile points and scrapers. The artifacts represent the latter part of the Middle Prehistoric Period overlain by an occupation of the Late Prehistoric Period. A nearby rock shelter (24CB223) was excavated and furnished similar material. The Sorenson site (24CB202), half a mile below Barry's Landing, was completely excavated with excellent results. Five levels of occupation extending from historic times back to the pre-Middle Prehistoric Period were delineated. Lanceolate projectile points in the lowest level (dated at 7,500-7,800 years ago) were overlain by materials of the Middle and Late Prehistoric Period and capped by a historic occupation. Materials included cordage, basketry, hide, bone tools, stone tools, roasting pits, and hearths. In the resurvey of this section of the canyon, 21 new sites were located, of which 18 will be flooded. Husted's party completed the season's work August 30 after 11 weeks in the field.

A survey party directed by Oscar L. Mallory, consisting of a crew of three, made a detailed reconnaissance of the Missouri Breaks along the Missouri River from Fort Benton to the upper reaches of the Fort Peck Reservoir. Beginning at the Fort Benton end of the Breaks, this party utilized boats, horses, vehicles, and foot transportation to locate 55 archeological sites within this 180-mile stretch of extremely rugged river country. Of these sites, 20 were campsites, 21 were campsites with tipi rings, 2 were burials, 3 were bison-kill sites, and 9 were historic sites. Surface collections were made from most of these and two were tested. Artifact yield was minimal but enough to suggest a fairly long period of occupation and significant excavation potential in the area.

The final Missouri Basin Project field party at work at the beginning of the year was directed by Carl F. Miller who, with a crew of nine, was at work in the Tuttle Creek Reservoir of northeastern Kansas. With headquarters in the town of Blue Rapids, Kans., this party investigated seven sites in the upper reaches of the reservoir and excavated one. This was the last chance to examine any of the threatened sites in this reservoir, as the water was already rising, and by the summer of 1963 any sites that were to be flooded would have been submerged. The Pishney site (39MH2) received the attention of Miller's party most of the season and provided a single house structure, a portion of a second house, several cache pits, and a substantial yield of artifacts. The houses at this site were square with rounded corners and the artifacts suggest a cultural position within the Central Plains Phase but with definite indications of influences from the south. Miller's party left the field on August 16 after working for a period of 9 weeks.

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Cooperating institutions active in the Missouri Basin at the beginning of the fiscal year included six field parties representing five State agencies in Nebraska, Kansas, Missouri, and Montana. Dr. Dee C. Taylor with a crew from Montana State University conducted a survey of portions of the shoreline of the Fort Peck Reservoir in east-central Montana, locating archeological sites that have been exposed by bank erosion along the shores of the reservoir. Marvin F. Kivett, assisted by Dr. Roger T. Grange with a crew from the Nebraska State Historical Society, completed salvage excavations in the area of the Red Willow Reservoir in southwestern Nebraska. Dr. Preston Holder, assisted by Dr. Emily Blasingham and a crew of University of Nebraska students, completed excavation and testing of sites to be flooded in the Norton Reservoir area of northwestern Kansas. Dr. Carlyle S. Smith, assisted by Walter Birkby and a crew of students from the University of Kansas, excavated two sites, sampled several others, and completed salvage work in the Melvern Reservoir area of east-central Kansas. Dr. Carl Chapman and a crew from the University of Missouri continued the surveying and testing of sites in the Kaysinger Bluff Reservoir area in west-central Missouri. A second crew tested a large series of sites in the Stockton Reservoir area of central Missouri. All these parties operated under agreements with the National Park Service and in cooperation with the Smithsonian Institution in the Inter-Agency Archeological Salvage Program.

The 1963 field season began with an archeological survey team under Lionel A. Brown, assisted by Lee G. Madison and Stephen H. Schwartz. This team began operations on May 6 and completed its work on May 29. It investigated the proposed area of the Almena Reservoir on Prairie Dog Creek, in northwestern Kansas, finding no archeological sites but recording one paleontological locality. The members of the party next went to the proposed area of the Herndon Reservoir on Beaver Creek in Rawlins County, Kans., where they recorded one archeological site. In Ellis County, Kans., on Big Creek, the proposed Ellis Reservoir was surveyed and two sites were recorded. The proposed area of the Fort Scott Reservoir in Bourbon County, Kans., was next surveyed and six sites were located. The next survey, made in Anderson County, Kans., found seven sites at the location of the proposed Garnett Reservoir. The final reservoir of the six surveyed was the Angus Reservoir in Nuckols County, Nebr., where two archeological sites were recorded. A total of 18 archeological sites and 1 paleontological locality were recorded in 6 reservoir areas.

On May 13 and 14, G. Hubert Smith and Oscar L. Mallory conducted a brief investigation of the site of the Fort Randall Military Post, near the Fort Randall dam in southeastern South Dakota. As an aid to the U.S. Corps of Engineers in developing this for public

use, Smith and Mallory pinpointed the significant cultural features and made recommendations for their development.

On June 7 the Pony Creek field party began work in that part of Mills County, southwestern Iowa, where the Soil Conservation Service is constructing several very small reservoirs and terracing most of the adjacent valley area. Headquartered in the town of Glenwood, this party of eight, directed by Lionel A. Brown, had by the end of the year visited and tested six sites (three of which had not previously been recorded) and begun excavations in sites 13ML4 and 13ML18, both of which appear to be villages of rectangular (or square) houses of the Nebraska Aspect.

On June 6 Dr. Elden Johnson of the University of Minnesota joined the staff of the Missouri Basin Project and spent 4 days in a brief investigation of the area of the James Diversion Project for detailed survey and excavation early in the next fiscal year.

The single field party in the Yellowtail Reservoir area of Montana and Wyoming, directed by Wilfred M. Husted, consisted of a crew of seven which left Lincoln on June 11. This crew started in the upper reaches of the reservoir where Husted's party left off the previous season. By the end of the year they had completed excavation of a small rock shelter and were continuing investigations on downstream.

In the Oahe Reservoir area of central South Dakota, three field parties were operating at the end of the year. Robert W. Neuman, in charge of a crew of eight, began work on June 11 at the Grover Hand site (39DW240), a group of Woodland burial mounds on the right bank of the Missouri River some 9 miles below Mobridge. By the end of the year, Mound 1 at this site had been excavated. This mound contained a burial pit covered with timbers. Bison skeletons were found on the mound floor.

The second Oahe party was directed by Oscar L. Mallory. With a crew of eight he began work on June 11 at site 39DW231, a presumed village or camp occupation site of the Plains Woodland Period that may be related to some of the burial mounds being dug by the Neuman party. The site is situated some 11 miles below Mobridge on the right bank of the Missouri River. Both the Neuman and Mallory crews camped at the Molstad ranch about a mile above the Grover Hand site, and both crews utilized 16-foot motorboats with 10-horsepower motors as their main means of transportation. This was necessitated by the high water of the Oahe Reservoir and the lack of roads in the area south of the Molstad ranch.

The third Oahe party also began work on June 11 under the direction of Dr. Alfred W. Bowers, who again joined the Missouri Basin Project staff for the summer, taking leave from his regular position at the University of Idaho. Dr. Bowers' crew of 10 camped at the east

edge of Mobridge and started digging on the Davis site (39CO14) at the west end of the Mobridge bridge. They had begun there the previous season and by the end of the year were well along with the excavations. They had also dug the last unexcavated lodge at the adjacent Red Horse site (39CO34) that Bowers's crew excavated in the 1962 season.

One historic-sites party was in the field at the end of the year, having begun work on June 14. This party, directed by G. Hubert Smith, was searching for some of the more obscure historic sites in the Big Bend Reservoir area, such as Loisel's Trading Post, Fort Defiance-Bouis, and the Red Cloud Agency. If they find any of these sites they will begin a program of excavations. By the end of the year Smith had devoted considerable time to searching records in various historical files both in Pierre and at Fort Pierre.

Three crews excavating prehistoric sites in the Big Bend area also began work on June 14. John J. Hoffman and a crew of 11 were at work at the end of the year on the series of sites, in the southeast corner of Lyman County on the right bank of the Missouri some 20 miles below Pierre, known as the "La Roche Sites." There, each of several sites has been called "La Roche" and much interpretation has been based on a concept of "La Roche." Hoffman's party was to excavate each of the sites and endeavor to identify some one element as La Roche and correlate the others with it. By the end of the year excavations were well under way in 39ST9, the site which W. H. Over many years ago designated as La Roche.

The second Big Bend field party was directed by William J. Folan, who joined the Smithsonian Institution staff, for the summer season, from Southern Illinois University. This crew of eight camped with the Hoffman crew and was directing its attention to the same problem. The two crews started together on the same site so that they would begin with the same orientation. By the end of the year Folan's crew was ready to move its operations to one of the other related sites in the area. All the sites appear to represent villages of late circular houses, or at least have one component of this "La Roche" trait.

The third Big Bend field party was directed by Richard E. Jensen. It consisted of a crew of 11 and was camped on the left bank of the Missouri in the "pocket" of the Big Bend, some 40 miles by road below Pierre. It was to conduct excavations in a series of circular-house villages nearby. By the end of the year progress had been made in work on the remains of an extensive, diffuse village, 39HU213. Widespread test trenching and the excavation of cache pits, middens, and a multiple burial had been completed.

Dr. William M. Bass of the University of Kansas, and an assistant, Walter Birkby of the same institution, joined the Missouri Basin

Project staff for the summer as temporary employees, in order to conduct laboratory research. Dr. Bass and his assistant analyzed a large quantity of skeletal material, excavated over the past several years by Dr. Bass, from several Missouri Basin sites in the Oahe Reservoir. Principal of these was the Sully site (39SLA) where 557 burials have been recovered. Bass and Birkby were working in the new laboratory facilities at the University of Kansas in Lawrence.

Cooperating institutions in the Missouri Basin at the end of the year included eight parties operating in five States. Dr. Dee C. Taylor and a Montana State University crew were continuing the shoreline survey of the Fort Peck Reservoir in east-central Montana, searching for and testing sites that had been exposed by bank erosion. Robert Gant and a University of South Dakota party were continuing a shoreline survey of the Gavins Point Reservoir in southeastern South Dakota, searching for and testing sites that had been exposed by bank erosion. Particular emphasis was being placed on the search for Plains Woodland and earlier sites. Both of these parties were continuing work begun the previous season. Dr. Preston Holder, assisted by James Marshall and a crew of University of Nebraska students, was excavating the Glen Elder site in the Glen Elder Reservoir in Mitchell County, north-central Kansas, and was searching for and testing additional sites within that reservoir. Dr. Carlyle S. Smith, assisted by Jon Muller and a party of Kansas University students, began the survey and testing of sites in the area to be flooded by the Milford Reservoir in Clay County, north-central Kansas. Dr. Carl Chapman had three University of Missouri parties at work at the end of the year. One was a survey group locating and testing sites in the area to be flooded by the Hackleman Corners Reservoir in southwestern Missouri. A second party was excavating sites in the Kaysinger Bluff Reservoir in west-central Missouri. The third party was digging sites in the Stockton Reservoir of west-central Missouri. Both of the latter were continuing work begun the previous season. Marvin F. Kivett, assisted by Dr. Roger T. Grange, Jr., and a Nebraska State Historical Society crew, surveyed two small reservoirs, Calamus and Davis Creek, in central Nebraska. Both surveys located only a few sites of doubtful archeological potential and it was recommended that no further work be done there unless material is uncovered during earth-moving operations for the construction of the two dams.

The Missouri Basin Chronology Program had been in operation for 5½ years by the end of the year. Cooperation of nearly all the archeologists and archeological institutions in the Plains area continued as in previous years, and leadership and direction of the program continued to be by the staff archeologists of the Missouri Basin Project.

In October a Missouri Basin Project team composed of J. J. Hoffman and Lee G. Madison joined Dr. Paul Sears of Yale University, Dr. J. G. Ogden of Ohio Wesleyan University, and Dr. Harry A. Tourtelot of the U.S. Geological Survey in a trip to collect fossil pollen cores in the sandhills of northwestern Nebraska. The field trip was a part of the chronology program and a part of a continuing program of palynology designed to reconstruct prehistoric floral conditions for a portion of the Missouri Basin. Cores were collected at several of the fossil lakes in the area and will be analyzed by Dr. Ogden.

Other chronology studies included a continuation of the dendrochronology section under the direction of Dr. Warren W. Caldwell, with the volunteer assistance of Harry E. Weakly. The carbon-14 section continued to progress with the addition of 16 new dated samples of vegetal material, tested by the laboratory of Isotopes, Inc., of Westwood, N.J. Robert W. Neuman continued to be in charge of this section of the program and submitted several samples for dating to the new carbon-14 laboratory at the Smithsonian Institution in Washington, D.C. In addition, two samples were sent to the University of Texas for analysis in its carbon-14 laboratory.

The laboratory and office staff of the Missouri Basin Project devoted most of its full effort during the year to processing specimen materials for study, photographing and illustrating specimens, preparing specimen records, and typing, filing, and illustrating record and manuscript materials. The accomplishments of the laboratory and office staff are listed in tables 1 and 2.

Dr. Robert L. Stephenson, chief, devoted a large part of his time during the year to management of the overall Missouri Basin Project, including the office and laboratory in Lincoln, the several field activities, and the preparation of plans and budgets. His individual archeological research and report writing was minimal during the year, but some further progress was made on the monograph "The Whitney Reservoir, Texas" and on analyses of specimens from his excavations at the Sully site (39SL4) in the Oahe Reservoir. He made final revisions on his manuscript "The Accokeek Creek Site: A Middle Atlantic Seaboard Culture Sequence" and submitted it to the University of Michigan for publication. He also revised a paper he read at the 1962 meeting of the Society for American Archeology, entitled "Administrative Problems of the River Basin Surveys," for publication in *American Antiquity*. He continued to serve as chairman of the Missouri Basin Chronology Program; as assistant editor of "Current Research" in the Plains Area for *American Antiquity*; and, until December 1, as associate editor of the *Plains Anthropologist*. On December 1 he became editor of that journal. He also participated in

the Visiting Scientist Program of the Nebraska Academy of Sciences and lectured to student groups at Sutton and Sidney, Nebr.

Dr. Stephenson attended the 19 $\frac{1}{2}$ Plains Conference in Pierre, S. Dak., in July and served as a panel member in a symposium on "The Salvage Program So Far." At the 20th Plains Conference in Lincoln on Thanksgiving weekend he served as local arrangements chairman and as chairman of a symposium on "Plains Chronology." During the period of December 12-21 he attended the "Management Development Program for Field Managers" of the U.S. Department of Agriculture Graduate School, held on the Voorhis Campus of California State Polytechnic College in San Dimas, Calif. He attended the 73d annual meeting of the Nebraska Academy of Sciences in Lincoln on April 27 and the annual meeting of the Society for American Archeology in Boulder, Colo., on May 1-3. While at Boulder he participated in the meeting of the Committee for the Recovery of Archeological Remains and reported on the year's activities of the Missouri Basin Project and on the prospects for the coming year. He wrote several book reviews for scientific journals, gave talks to various local civic organizations on the work of the River Basin Surveys, and represented the Smithsonian Institution at special occasions at the invitation of local civic organizations. He served throughout the second half of the year on the organizing committee for the INQUA meetings to be held in Boulder, Colo., in September 1965, and was named as one of the field conference organizers for a preconference field trip through the Plains area.

Lionel A. Brown, archeologist, when not in charge of field parties, devoted most of his time to analyzing specimen materials he had recovered during the past year and to materials recovered by others in the Missouri Basin in previous years. He completed a major draft of a manuscript entitled "Archeology of the Lower Yellowtail Reservoir, Montana," which describes the work and material recovered from the several sites that he excavated and tested in that area during the summer of 1963. He completed a major draft of a preliminary manuscript entitled "Archeological Investigations in the Pony Creek Watershed, Iowa," which describes the work and reports the analyses of materials he recovered from that area of southwestern Iowa in the spring of 1962. This manuscript will be combined with the report of the work currently being done in that area to form an overall publication on the Pony Creek researches. In the early spring he studied the specimens and field records from the Gillette site (39ST23) in the Oahe Reservoir, excavated by Donald D. Hartle of the Missouri Basin Project in 1957, and nearly completed the major draft of a manuscript covering those investigations.

In July Mr. Brown addressed the Billings Archeological Society in Billings, Mont., on the subject "The Amateur Archeologist in the Salvage Program." During Thanksgiving weekend he attended the 20th Plains Conference in Lincoln and presented two papers, "A Survey of the Pony Creek Watershed" and "Archeology of the Lower Yellowtail Reservoir." Both were published in abstract in the *Proceedings of the 73d Meeting of the Nebraska Academy of Sciences*. He attended the meetings of the Society for American Archeology in Boulder, Colo., on May 1-3. At the end of the year he was again excavating archeological sites in the Pony Creek area of Iowa.

Dr. Warren W. Caldwell, archeologist, was in the field from the beginning of the year until the end of August. He devoted the remainder of his time to specimen and field-record studies concerning sites that he had excavated in previous years. Primary attention was devoted to the analyses (with Richard E. Jensen) of sites 39LM208, 39LM209, and 39LM232, excavated last year in the Big Bend Reservoir of South Dakota by Caldwell and Jensen. He completed the analytical studies and began a manuscript reporting the results. He also completed analyzing materials from, and prepared a major draft of a monograph on, "Investigations at the McKensy Village (39AR-201), South Dakota," a site that he excavated in 1960. In collaboration with G. Hubert Smith, he prepared and submitted for publication a handbook for the U.S. Corps of Engineers' Reservoir Series, entitled "Oahe Reservoir: Archeology, History and Geology." This was the fourth handbook in this series, prepared by the same authors. He also prepared a popular article on "Fortified Villages of the Dakotas," published in *Missouri Basin Progress*. He published two book reviews in the *Plains Anthropologist* and prepared several administrative and progress reports concerning the work of the Missouri Basin Project.

Dr. Caldwell participated in the 19½ Plains Conference in Pierre in July and discussed his current fieldwork. He participated in the 20th Plains Conference in Lincoln at the end of November, presenting a paper on "Investigations in the Lower Big Bend Reservoir, South Dakota" and also serving as a panel member on "Plains Chronology," presenting a discussion of "Dendrochronology in the Plains—Past and Present." He attended the 73d annual meeting of the Nebraska Academy of Sciences and presented a paper, "Primus in Orbe Deos Fecit Timor or Ceramics ad Nauseam," that was published in abstract in the *Proceedings* of the meeting. His paper "Fortified Villages of the Northern Plains" was read in absentia at the annual meeting of the Society for American Archeology in Boulder, Colo., on May 3. Throughout the year he continued to serve as chairman of the dendrochronology section of the Missouri Basin Chronology Program, as con-

tributing editor for book reviews for the *Plains Anthropologist*, and as collaborator for the Plains area for "Abstracts of New World Archeology." He participated in the visiting scientist program of the Nebraska Academy of Sciences, lecturing to student groups at Gretna, Nebr., on January 8. During the period from September to June, on annual-leave time, he served as part-time assistant professor in the Department of Anthropology at the University of Nebraska and taught a course on "The American Indian." At the end of the year he was in the Lincoln laboratory analyzing specimens from past fieldwork.

John J. Hoffman, archeologist, when not in the field conducting excavations, devoted most of his time to laboratory analyses and preparation of reports resulting from his work of the past season. He completed the analyses of specimen materials and records of his 1962 excavations at the Molstad Village site (39DW234) in the Oahe Reservoir area and prepared a major draft of a manuscript on this work. He completed a short article on the "Molstad Village and the La Roche Sites" and submitted it to the *Plains Anthropologist* for publication. By the time he returned to the field in June he was well along on a manuscript entitled "The Swift Bird Lodge (39DW233)." In July, Hoffman attended the 19½ Plains Conference in Pierre and reported on his fieldwork during the season. At Thanksgiving, he presented a paper at the 73d annual meeting of the Nebraska Academy of Sciences in Lincoln entitled "Temporal Ordering of the Chouteau Aspect." The end of the year found him again in the field engaged in archeological excavations.

Wilfred M. Husted, archeologist, while not in the field conducting archeological excavations, was at work in the laboratory analyzing materials and preparing reports on his activities in the field during the 1962 season and also on materials that others had collected in previous seasons. He wrote a "Preliminary Report of the 1962 Archeological Investigation in the Upper Yellowtail Reservoir," which will be combined with a study of his 1963 season's work in the same area so that there will be a comprehensive monograph on the archeology of that region. He also completed the laboratory analyses of, and prepared a major draft of a monograph on "The Brice (39LM31) and Clarkstown (39LM47) Sites, Fort Randall Reservoir." These two sites were excavated in 1954 by the late Paul L. Cooper. At the 20th Plains Conference, November 22-24 in Lincoln, he presented a paper entitled "Investigations in Upper Yellowtail Reservoir, Montana-Wyoming."

Richard E. Jensen, archeologist, spent July, August, and June in the field conducting archeological excavations and the remainder of the year in the laboratory in Lincoln analyzing materials and

writing reports. He prepared descriptions of the artifacts and features recovered from the Langdeau site (39LM209), the Jiggs Thompson site (39LM202), and the Pretty Head site (39LM232), which he excavated in conjunction with Dr. Caldwell. They include various statistical analyses relative to sequential alignments and relationships to other sites. In July he gave a report of his current field work at the 19½ Plains Conference in Pierre. During Thanksgiving he attended the 20th Plains Conference in Lincoln. On May 18, accompanied by J. J. Hoffman and Dr. Stephenson, he attended an informal conference on Dakota pottery typology in Vermillion, S. Dak. He and Hoffman proceeded from Vermillion to the Big Bend Reservoir area to select campsites for the summer. At the end of the year he was again in the field excavating archeological sites in the Big Bend Reservoir area.

Oscar L. Mallory, archeologist, when not in the field was at work in the laboratory examining materials previously collected. He studied the background data and analyzed the specimens obtained from the "Missouri Breaks" area of Montana and prepared a report on the work entitled "An Archeological Appraisal of the Missouri Breaks Region, Montana." He then began a detailed analysis of the unusual collection of perishable goods from the Mouat Cliff Burial site (24TE401) excavated last year by the Billings Archeological Society, in central Montana, near Hardin. He spent much of his evening and weekend time working on "A Comparative Cultural Analysis of Textiles from McGregor Cave, Washington," his thesis for a master of arts degree at Washington State College. In April he served, with Robert W. Neuman, as adviser to the U.S. Army Corps of Engineers in conference with the local community developers of Moberg, S. Dak., on a project to reconstruct an earth-lodge village in that area. He presented a paper, "Survey of the Missouri Breaks Area," at the 20th Plains Conference in Lincoln on Thanksgiving weekend. At the close of the year he was conducting archeological excavations in the Oahe Reservoir area.

Robert W. Neuman, archeologist, when not in the field was mainly at work in the laboratory doing research on materials excavated by him in past years in the Oahe and Big Bend Reservoir areas. From October 6 to 13 he was on loan to the University of South Dakota to assist in salvage excavations at the Wolfe Creek Mound site (39HT-201) in Hutchinson County, S. Dak. In the laboratory, he corrected galley proof on his monograph "The Good Soldier Site (39LM238), Lyman County, South Dakota," being published by the Bureau of American Ethnology as a River Basin Surveys Paper. He did research on materials from his Big Bend excavations and brought to near completion a manuscript on "Pre-ceramic Occupations in the Big Bend Reservoir Area, South Dakota." He also served as chairman of

the radiocarbon section of the Missouri Basin Chronology Program. He reported on his current fieldwork at the 19½ Plains Conference in Pierre in July. He attended the 20th Plains Conference in Lincoln, November 22-24, where he served as a panel member in the symposium on "Plains Chronology," presenting a discussion of "Carbon-14 on the Plains—Past, Present and Future." In mid-April he and Oscar L. Mallory served as advisers to the U.S. Army Corps of Engineers in discussions with local community supporters of a project to reconstruct an earth-lodge village near Mobridge, S. Dak. On April 27 he served as chairman of the Anthropology Section of the 73d annual meeting of the Nebraska Academy of Sciences in Lincoln and presented a paper entitled "A Brief Review of Anthropology in the Nebraska Academy of Sciences," that was published in abstract in the *Proceedings* of the meeting. This was the best attended and had the largest selection of outstanding papers of any of the meetings of this section of the Academy since its inception. He also attended the annual meetings of the Society for American Archeology in Boulder, Colo., May 1-3, where he presented a paper entitled "Check Stamping on the Northern Plains," that has been accepted for publication in *American Antiquity*. At the end of the year Neuman was conducting excavations in the Oahe Reservoir area.

G. Hubert Smith, archeologist, spent July, August, and the last half of June conducting archeological excavations, and during the remainder of the year was in the Lincoln office analyzing and doing research on materials from historic sites in the Missouri Basin that he had excavated in previous years. He completed a report on the fieldwork done at the site of Fort George (39ST202) in the summer of 1962, and had a major draft of that manuscript ready for final typing at the end of the year. He continued with the preparation of the comprehensive report on the site of "Like-a-Fishhook Village and Fort Berthold I and II (32ML2), North Dakota." With Dr. Caldwell he prepared a popular booklet on "The Oahe Reservoir: Archeology, History and Geology," that was published by the U.S. Army Corps of Engineers in their Reservoir Series, of which this is the fifth. He also prepared a book review published in *American Antiquity* in April.

Smith attended the 19½ Plains Conference in Pierre in July and reported on his current fieldwork. During the Thanksgiving weekend he attended the Plains Conference in Lincoln, where he reported on "Excavations at Fort George, South Dakota." On January 10, he was the featured speaker at the meeting of the Yankton County Historical Society in Yankton, S. Dak., where he gave an illustrated talk on "Salvage Archeology." On April 27 he attended the 73d annual meeting of the Nebraska Academy of Sciences in Lincoln and presented a paper entitled "Ethnographic Contributions of Ferdinand

V. Hayden." He attended the 17th annual meeting of the Mississippi Valley Historical Association and took part in the historic sites committee meeting of that group. He addressed the Kansas City Archeological Society on "Historical Archeology in the Missouri Basin" on May 7, and on May 19 he gave an illustrated talk on "Historic Buildings of Nebraska" at the Nebraska State Historical Society in Lincoln. At the end of the year he was again in the field conducting investigations of historic sites in the Big Bend Reservoir.

TABLE 1.—*Specimens processed, July 1, 1962–June 30, 1963*

Reservoir	Number of sites	Catalog numbers assigned	Number of specimens processed
Big Bend.....	13	4, 354	24, 196
Missouri Breaks.....	24	178	390
Oahe.....	10	2, 978	22, 400
Pony Creek.....	13	408	1, 775
Yellowtail.....	22	1, 749	3, 038
Site totals.....	82	9, 667	51, 799
Collections not assigned site numbers.....	2	11	24
Overall collection totals.....	84	9, 678	51, 823

As of June 30, 1963, the Missouri Basin Project had cataloged 1,391,219 specimens from 2,410 numbered sites and 60 collections not assigned site numbers.

Specimens restored: Five pottery vessels and six vessel sections.

Specimens donated to the Missouri Basin Project for comparative use: By the W. H. Over Museum, University of South Dakota, courtesy of Dr. Wesley R. Hurt—75 pot rim sherds collected from 39GR1 (Scalp Creek site), 39WW7 (Swan Creek site), and 39WW303. These sherds represent eight pottery wares, namely: Akaska, Le Beau, Randall, Rygh, Scalp, Steamboat, Swan Creek, and Talking Crow.

TABLE 2.—*Record material processed, July 1, 1962–June 30, 1963*

MISSOURI BASIN PROJECT

Reflex copies of records.....	8, 967
Photographic negatives made.....	3, 128
Photographic prints made.....	13, 712
Photographic prints mounted and filed.....	7, 660
Transparencies mounted in glass.....	66
Kodachrome pictures taken in lab.....	72
Cartographic tracings and drawings.....	38
Illustrations.....	27
Lettering of plates.....	12
Profiles drawn.....	92
Plate layouts made for manuscripts.....	18

Virginia.—During the period September 10–November 18, 1962, Carl F. Miller conducted excavations in four sites in the Smith Mountain and Leesville reservoir areas. Data obtained indicate that the cultural range represented extended from the terminal phase of Late Archaic around 4000 B.C. to the Middle Woodland Period at about A.D. 500. One of the characteristic artifacts normally associated with such remains, namely, stone projectile points, was scarce, while ceramics and bone tools were rather plentiful. There were numerous portions and fragments from clay tobacco pipes. As a matter of fact, those particular objects were much more numerous than has been indicated by evidence from that general area.

Mr. Miller returned to the Smith Mountain Project area on May 15, 1963, and from that date until the end of the fiscal year was occupied in the excavation of the Hales Ford site (44FR15). In the work there thirty-seven 10-foot squares were dug to a depth of 5 feet; 136 features and 1 partial burial were recovered. The burial, representing an early Middle Woodland Phase, was that of a male who was about 60 years of age at the time of death. Mortuary offerings consisted of two turtle-shell dishes. The use of turtle shells for dishes apparently was a well-established trait at that location. At least two new pottery types were found at the Hales Ford site, and they were apparently correlated to a similar textile-impressed type found in the John H. Kerr Reservoir area farther south on the Roanoke River. The latter, however, produced much less of this type than the Smith Mountain Reservoir. The significance of this will need to be determined by further studies in the laboratory. The projectile points recovered are sufficient in number to illustrate a developmental series. This also is true of clay pipes. The bone material was particularly well preserved, and several new types of artifacts were recovered. Potsherds number into the thousands, and it will be possible to restore a number of vessels from them. No European material was found at the site, which apparently was abandoned well before the White man's influence reached that part of Virginia. No evidence was obtained relative to habitations and consequently nothing is known of the type of dwelling used at that locality.

The material from the combined work in the fall of 1962 and the spring of 1963 will give an excellent source of information about a fairly long period of occupation in the upper reaches of the Roanoke River.

ARCHIVES

The Bureau archives continued under the custody of Mrs. Margaret C. Blaker, archivist. She was assisted throughout the year by Miss

Regina M. Solzbacher, and on a part-time basis by Miss Margaret V. Lee.

During the week of September 30–October 6, Mrs. Blaker attended the annual meeting of the Society of American Archivists in Rochester, N.Y., and searched for early photographs of American Indians in the collections of George Eastman House, the Rochester Historical Society, and the Rochester Museum of Arts and Sciences. A considerable number of fine stereoscopic views of the 1870's and 1880's were located at Eastman House, and copies of them are currently being made for the Bureau collections. At the University of Rochester Library Mrs. Blaker examined the notebooks of Louis Henry Morgan that deal with his visits to the Seneca Indians, and the circulars containing the original information collected and used by Morgan in preparing his *Systems of Consanguinity*, published by the Smithsonian in 1870. Microfilm duplicates of the circulars will be made available to the Bureau through the library's special collections division.

On October 12–15 Mrs. Blaker attended the joint annual meeting of the American Indian Ethnohistoric Conference and the Iroquois Conference at Albany, N.Y., and examined photographic and other pictorial resources on the American Indian in the New York State Museum. On November 14–19 she attended the annual meeting of the American Anthropological Association in Chicago and examined pictorial resources in the Newberry Library and the Chicago Natural History Museum. On May 20–21 she visited Carlisle, Pa., to see photographs in the collections of the Army War College and the Hamilton Library. Both of these institutions have albums of excellent photographs of the students who attended Carlisle Indian school and of their parents, many of them distinguished chiefs, who visited the school. Arrangements for borrowing the albums for copying are in progress.

Ethnographic notes of the late Lyda Averill Taylor, on the Alabama, Choctaw, and Koasati, collected in Polk County, Tex., in 1936–40, and a partial draft of a manuscript on comparative southeastern ethnology, were received from John M. Goggin, to whom they had been given in 1960 by Walter W. Taylor.

A ledger containing drawings of war scenes, apparently all drawn by the same Indian artist, was acquired. The book is undated and the artist unidentified, but he was probably a Cheyenne, since the short written titles indicate that the winners of the contests depicted were Cheyennes. Cheyenne warfare with a number of different tribes is portrayed—Osage, Snake (Shoshoni), Pawnee, Ute, Crow, Shawnee, Sac and Fox, Navaho, and Pueblo. There are also a number of pictures of combat with the U.S. Army. Two pictures depict the

Cheyenne Indian "Horse Road in fight with General Miles near Red River," and another, the historic fight of the Cheyenne with Forsyth's scouts at Beecher's Island on September 17, 1868, in which Chief Roman Nose was killed. Another drawing depicts a Cheyenne battle with soldiers under Lieutenant Henley, 6th Cavalry, on Smoky Hill River, and one shows Indians running off cavalry horses at Fort Dodge, 1865.

A sketchbook containing crayon and pencil drawings of Indian life on the Plains, made by a Cheyenne Indian named Buffalo Meat, while he was a prisoner at Fort Marion, Fla., about 1875 was received as a gift from Miss Julia Whiting of Middleburg, Va.

A photograph of an oil painting of the Comanche chief Yellow Wolf, made in 1859 by Col. Arthur T. Lee, and a photograph of a drawing made by Yellow Wolf were received through the courtesy of Charles F. Hayes III, of the Rochester Museum of Arts and Sciences, Rochester, N. Y., which owns the originals.

Negatives of four sketches of Missisauga Indians, three of Hurons and two of Creek Indians, all drawn by Basil Hall in 1827-28, were obtained from the Lilly Library, Indiana University, which owns the original drawings.

An important collection of photographic negatives and prints, taken by Jesse Hastings Bratley in the period 1893-ca. 1903, while he was teaching at Indian schools in the West, was lent by Francis V. Crane, director of the Southeast Museum, Marathon, Fla. A total of 280 copy negatives were made and added to the Bureau files. Most of the negatives relate to the Dakota Indians of Rosebud Reservation, S. Dak.; the Havasupai of Cataract Canyon, Ariz.; and the Hopi of Polacca, Ariz. There are also a few photographs of Salish Indians of Puget Sound, and of Cheyenne and Arapaho from Contonment, Okla.

A series of 36 negatives taken at the mouth of Windy River, northwestern extremity of Neultin Lake, southwestern Keewatin, Canada, in 1947 shows Caribou Eskimo and a few Cree Indians. The negatives include portraits; camp scenes showing food and hide preparation; and views of transport by canoe and on foot with pack and dog travois. They were made and donated by Dr. Francis Harper, Chapel Hill, N. C. Dr. Harper also donated five negatives showing Poosepatuck men and native fishing equipment, taken by him at the Poosepatuck Reservation, Mastic, Long Island, in 1909 and 1910.

A series of 11 photographs taken at the Poosepatuck Reservation, Mastic, Long Island, showing members of the Poosepatuck tribe, and views taken at the June meeting at Poosepatuck in 1912, were copied from an album of snapshots owned by Walter B. Raynor, Patchogue, N. Y. Two photographs of White men's hunting camps having pal-

metto-thatch structures built in the Seminole style were from the same album.

Nineteen portraits of Jicarilla Apaches and views taken on the Jicarilla Reservation near Dulce, N. Mex., ca. 1915-62, were copied from photographs lent by Dr. D. Harper Sims, Arlington, Va.

Negatives of four views of the monument on the grave of the Choctaw chief Pushmataha, in the Congressional Cemetery, Washington, D.C., were deposited by Dr. William C. Sturtevant.

A photograph of a Shoshoni chief, Jack Edmo, and his family, taken about 1917, was donated by Mrs. Arthur White, Middleburg, Va.

A collection of 90 Indian portraits from the studios of a number of late 19th-century commercial photographers was obtained through Carl Russell, Orinda, Calif. Over 50 of the portraits are of members of various Dakota tribes; other tribes represented are Apache, Crow, Diegueño, Maricopa, Papago, and Yuma.

A collection of approximately 675 photographic negatives made in the approximate period 1900-1920 has been acquired but is not yet cataloged in detail. The collection consists of studio and outdoor portraits, camp scenes, views of dances, and other subjects. Of the more than 25 tribes represented, the principal ones are: Apache, Arapaho, Assiniboin, and Gros Ventres; Blackfoot, Cheyenne, Crow, Dakota, Eskimo, Hopi, Osage, Pawnee, Seminole, and Wichita.

LIBRARY

During the year 1962-63, work continued on the organization of the collection and its records under the supervision of Mrs. Carol Jopling in the Bureau of American Ethnology Library.

When the library's maps were evaluated, several very old and rare ones were discovered. Among them were a Nicholas Visscher map of the Western Hemisphere, *Novissima et Accuratissima Totius Americae*, and *Nova Belgica et Anglia Nova* by W. J. Blaeu (Amsterdam, 1635). Of particular interest to the Bureau, however, was the *Census of the State of California* (1852) map and a quantity of other North American maps with linguistic and archeological annotations.

Some fine books were given to the library, including a set by Sir Richard Phillips, *A Collection of Modern and Contemporary Voyages and Travels* (London, 1805-) presented by Dr. Frank H. H. Roberts, Jr.

The librarian attended the Special Libraries Convention in Denver, June 9-14, 1963, and visited a number of libraries and museums having special collections on the North American Indian and Western history.

The following statistics will serve to indicate some of the work conducted in the library :

Reference questions answered.....	1, 820
Library users.....	1, 301
Publications circulated.....	1, 071
Loans to other libraries.....	151
Volumes sent for binding.....	1, 103

EDITORIAL WORK AND PUBLICATIONS

The editorial work of the Bureau continued during the year under the immediate direction of Mrs. Eloise B. Edelen. The following publications were issued :

- Seventy-ninth Annual Report of the Bureau of American Ethnology, 1961-62. ii+29 pp., 2 pls. 1963.
- Bulletin 181. Isleta paintings, with introduction and commentary by Elsie Clews Parsons. Edited by Esther S. Goldfrank. xvi+299 pp., 142 pls. 1962.
- Bulletin 182. River Basin Surveys Papers, No. 25. Frank H. H. Roberts, Jr., editor. xvi+447 pp., 110 pls., 65 figs., 20 maps. 1962.
- Archeology of the John H. Kerr Reservoir Basin, Roanoke River, Virginia-North Carolina, by Carl F. Miller. With appendix: Human skeletal remains from the Tollifero (Ha6) and Clarksville (Mc14) sites, John H. Kerr Reservoir Basin, Virginia, by Lucile E. Hoyme and William M. Bass.
- Bulletin 184. The Pueblo of Sia, New Mexico, by Leslie A. White. xii+358 pp., 12 pls., 55 figs. 1962.
- Bulletin 185. River Basin Surveys Papers, Nos. 26-32, Frank H. H. Roberts, Jr. editor. xii+344 pp., 57 pls., 43 figs., 5 maps. 1963.
- No. 26. Small sites on and about Fort Berthold Reservation, Garrison Reservoir, North Dakota, by George Metcalf.
- No. 27. Star Village: A fortified historic Arikara site in Mercer County, North Dakota, by George Metcalf.
- No. 28. The dance hall of the Santee Bottoms on the Fort Berthold Reservation, Garrison Reservoir, North Dakota, by Donald D. Hartle.
- No. 29. Crow-Flies-High (32MZ1), a historic Hidatsa village in the Garrison Reservoir area, North Dakota, by Carling Malouf.
- No. 30. The Stutsman Focus: An aboriginal culture complex in the Jamestown Reservoir Area, North Dakota, by R. P. Wheeler.
- No. 31. Archeological manifestations in the Toole County section of the Tiber Reservoir Basin, Montana, by Carl F. Miller.
- No. 32. Archeological salvage investigations in the Lovewell Reservoir Area, Kansas, by Robert W. Neuman.
- Bulletin 188. Shonto: A study of the role of the trader in a modern Navaho Community, by William Y. Adams. xi+329 pp., 10 pls., 3 figs., 3 maps, 12 charts. 1963.
- Publications distributed totaled 17,722 as compared with 19,326 for the fiscal year 1962.

ILLUSTRATIONS

The staff artist for the Bureau of American Ethnology, E. G. Schumacher, prepared the illustrations to accompany 16 manuscripts to be

published by the Bureau, some as entire bulletins and others composing bulletins in the Anthropological Papers and the River Basin Surveys Papers series. The work included the drawing or redrawing of maps, diagrams, charts, and other text figures, and effectively combining and mounting photographs, all covering the fields of anthropology, archeology, and ethnology. Approximately 500 illustrations were prepared.

MISCELLANEOUS

Dr. M. W. Stirling, Dr. A. J. Waring, and Sister Inez Hilger continued as research associates. Dr. Wallace L. Chafe, linguist on the staff of the Bureau from April 4, 1959, resigned on August 20, 1962, to accept an associate professorship in the department of linguistics at the University of California in Berkeley.

In addition to the usual extensive correspondence answering specific questions, many of which were of a technical nature, the Bureau prepared several bibliographies to provide reference material for which there has been recurring demand. Among those recently compiled, the following were printed by the multilith process:

SIL-2, 3d rev., 6/63: Selected bibliography on arrowheads. 5 pp.

SIL-105, rev., 7/62: Selected bibliography on Cherokee customs and history. 6 pp.

SIL-174, rev., 6/63: Selected references on the Indians of Southeastern North America. Compiled by William C. Sturtevant. 17 pp.

SIL-363, 4/63: Bibliography of wild food plants of Canadian Indians. Compiled by F. R. Irvine. 13 pp.

Other bibliographies prepared are in typescript.

More than 100 specimens, both ethnological and archeological, were received by mail or brought to the office for identification and such information as could be provided by Bureau specialists.

Respectfully submitted.

FRANK H. H. ROBERTS, Jr., *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the National Zoological Park

SIR: I have the honor to submit the following report on the condition and operations of the National Zoological Park for the fiscal year ended June 30, 1963:

GIFTS

A number of accessions to the animal collection were due to the generosity of friends of the National Zoological Park. On January 6, 1963, a fine Bengal tiger arrived from the zoo in Ahmedabad, India, as a gift from Ralph Scott of Washington and Miami Beach. Although Samson is a normally colored tiger, he carries the white genes, being both half-brother and uncle to Mohini, the Zoo's white tigress. Samson was bred under the direction of the Maharajah of Rewa. The two animals are now living together, and it is hoped that they will produce white cubs.

Edward D. Sweeney and Ralph E. Becker, both of Washington, presented a pair of husky young polar bears which they acquired on a voyage to the Arctic last summer.

The U.S. Air Force retired Ham, the chimpanzee astronaut, which on January 31, 1961, soared through space in a capsule boosted by an 83-foot Redstone rocket. Ham's 16-minute ride took him to a height of 155 miles and a distance of 420 miles down the coast from Cape Canaveral. He seems to have adjusted nicely to his comparatively quiet routine in the Zoo's ape quarters, which he entered on April 5, 1963.

The U.S. Forest Service captured a young adult female (cinnamon phase) American black bear, which was flown to Washington from New Mexico and installed in a cage adjoining that of the famous Smokey Bear. The formal presentation was made on September 8 by New Mexico Forester Ray L. Bell on behalf of the Department of Game and Fish and the New Mexico State Land Office, the Ghost Ranch Museum, and the Governor and Senators of New Mexico. "Goldie," soon to be "Mrs. Smokey," was accepted on behalf of the Smithsonian Institution by Dr. Carmichael.

The State of Hawaii sent a pair of nene, or Hawaiian geese. A few years ago these birds were threatened with extinction by hunters and predators. The State Fish and Game Division undertook a program of propagating the birds in captivity and then releasing them to join wild birds in sanctuary areas on Hawaiian volcanoes, and the

numbers have now increased. The nene, the State bird of Hawaii, is an attractive bird and an interesting addition to the national collection; it had not been exhibited here since 1936. The pair was presented by the Honorable Daniel K. Inouye, Senator from Hawaii, on June 19, 1963, and formally accepted by the Secretary of the Smithsonian Institution. The Zoo is grateful to Paul Breese, Director of the Honolulu Zoo, for his efforts in obtaining for it these rare specimens.

Through Alton W. Hemba, American Consul General at Guayaquil, Ecuador, a large Galápagos tortoise (from Albemarle Island) was received as a gift from Dr. Jorge E. Proano P.

Volkmar Wentzel, of the National Geographic Society, presented to the Zoo a young specimen of the giant forest rat which he obtained during his travels in Africa. This animal is now more than 2 feet long (including the tail) and is still growing.

Dr. Doris M. Cochran, curator of reptiles and amphibians at the U.S. National Museum, presented a number of reptiles collected on a trip to Central and South America.

A gift of two hummingbirds, *Helimaster squamosus* and *Colibri delphinae greenewaltii*, was received from Dr. Augusto Ruschi, Santa Teresa, Brazil. Dr. Ruschi is an authority on the Colibridae and is noted for his splendid collection of live birds. His visit to the National Zoological Park last September established the standards and methods of care for a large group of hummingbirds to be applied when the renovation of the birdhouse is completed.

Kenneth Sather, Round Lake, Minn., sent four giant Canada geese (*Branta canadensis major*), a form previously thought to be extinct: a welcome addition to the waterfowl collection.

The National Zoological Park's animal collection has also been generously enriched by the Eistophos Science Club of Washington, D.C., and Mrs. Joseph Campbell, also of Washington.

Space does not permit listing all gifts received in the course of the year, but the following are of special interest:

Bogley, Samuel W., III, Hyattsville, Md., woolly monkey.

Cochran, Dr. Doris, Washington, D.C., bronze vine snake, 2 Central American toads, Brazilian striped frog, Raddi's frog, Brazilian light-spotted frog, 14 diamondback terrapins, South American water turtle.

Dembin, Edward and Eugene, Washington, D.C., Western indigo snake, red-tailed boa, boa constrictor, bull snake.

DePrato, Mario, Washington, D.C., river frog, Hermann's tortoise.

Florida Nurserymen and Growers Association, Key Biscayne, Fla., through Jim Griffin, 2 mandarin ducks, chestnut-breasted teal, 2 fulvous tree ducks.

Fulton, Mrs. Robert, Washington, D.C., keel-billed toucan.

George's Pet Shop, Bladensburg, Md., speckled agouti, black agouti, 2 jaguarondis, anaconda, 2 matamata turtles, 2 boa constrictors.

Hadley, Mrs. Harry E., Annandale, Va., ocelot.



Still thriving, the Siberian crane (*Grus leucogeranus*) that came to the National Zoological Park on June 26, 1906.



Nene, or Hawaiian geese (*Branta sandvicensis*), in their pool at the National Zoological Park.



An unusually long-lived many-banded krait (*Bungarus multicinctus*). This specimen arrived at the National Zoological Park as an adult on April 3, 1958.



Malayan monitor (*Varanus salvator*), well camouflaged in grass in its outdoor summer cage occasionally stalks and catches birds. National Zoological Park.



Male lowland gorilla born at the National Zoological Park on September 9, 1961. Tomoka at 1 year 7 months with a basketball.



Baby gibbon born in this outdoor enclosure on December 8, 1962. National Zoological Park.



One of the brindled gnus (*Connochaetes taurinus*) born at the National Zoological Park. Photograph by Walter Oates, Washington Evening Star.

Hecht Co., Washington, D.C., blue peacock.
 Henderson, Paul, Silver Spring, Md., drill.
 LaDu, Dr. Bert N., Bethesda, Md., habu snake.
 Locke, Otto Martin, New Braunfels, Tex., 5 coachwhip snakes, 4 racers, 2 yellow bullsnakes, 2 indigo snakes.
 Olafson, Joseph M., Falls Church, Va., jaguarondi.
 Purkis, Mrs. Dorothy, Washington, D.C., woolly monkey.
 Safeway Warehouse, Landover, Md., South American opossum.
 Silva, James R., Washington, D.C., red-shouldered hawk.
 Smith, Mrs. Hiram, Richmond, Va., ocelot.
 Smith, Mrs. Leland F., Washington, D.C., cockatiel.
 U.S. Department of Agriculture, Beltsville, Md., mink.
 U.S. Fish and Wildlife Service: Mason, Mich., bald eagle; Seattle, Wash., 4 bald eagles; Washington, N.C., bald eagle.
 U.S. National Museum, through Dr. Philip Humphrey, 6 red-tailed tropicbirds.

BIRTHS AND HATCHINGS

Following the procedure of previous years, all births and hatchings are listed below, whether or not the young were successfully reared. In many instances the record of animals having bred in captivity is of interest.

MAMMALS

<i>Common name</i>	<i>Number</i>	<i>Common name</i>	<i>Number</i>
Squirrel glider.....	1	Neumann's genet.....	5
Rat kangaroo.....	1	Formosan spotted civet.....	2
European hedgehog.....	1	Water civet.....	1
Ring-tailed lemur.....	1	Bobcat.....	1
Squirrel monkey.....	*1	Serval.....	1
Black spider monkey.....	2	Black leopard.....	2
Rhesus monkey.....	1	African lion.....	4
Barbary ape.....	4	Sea-lion.....	1
Sooty mangabey.....	*1	Grant's zebra.....	*1
DeBrazza's guenon.....	*1	Collared peccary.....	3
Hybrid gibbon.....	2	Hippopotamus.....	1
Chimpanzee.....	1	Pygmy hippopotamus.....	2
Two-toed sloth.....	2	Llama.....	4
Woodchuck.....	5	White fallow deer.....	2
Prairie-dog.....	2	Axis deer.....	2
Beaver.....	1	Red deer.....	2
Crested rat.....	1	Sika deer.....	4
Egyptian spiny mouse.....	9	Virginia deer.....	3
Patagonian cavy.....	9	Reindeer.....	7
Speckled agouti.....	*1	Caribou × reindeer.....	1
Jackal.....	3	Brindled gnu.....	2
Timber wolf.....	5	Yak.....	1
Korean bear.....	2	Cape buffalo.....	1
European brown bear.....	3	Dorcas gazelle.....	2
Grizzly bear.....	2	African pygmy goat.....	2
Hybrid bear.....	2	Barbary sheep.....	*2
Raccoon.....	2		

*Stillborn.

BIRDS

<i>Common name</i>	<i>Number</i>	<i>Common name</i>	<i>Number</i>
Crested screamer.....	4	Mallard duck.....	33
Whooper swan.....	1	Peafowl.....	4
Canada goose.....	4	Kookaburra.....	8
Wood duck.....	28	Formosan red-billed pie.....	3

REPTILES

Box turtle.....	1	Crevice spiny lizard.....	31
Painted turtle.....	10	Ribbon snake.....	8
Red-lined turtle.....	31	Queen snake.....	6
Yellow-bellied turtle.....	13	Garter snake.....	8
Northern yellow-bellied turtle.....	10		

DEPOSITS

During the process of the National Zoological Park's capital improvement program, animals which are rare in the United States and would be crowded or poorly housed during the construction period are being sent to municipal zoos and other facilities. During the past year rare or valuable specimens have been dispersed to locations thought to have good breeding conditions as well as better living accommodations. Other animals have been dispersed with the understanding that they or similar specimens will be returned when suitable portions of the new exhibit areas are available here in the park. These deposits are:

- Brookfield Zoo, Brookfield, Ill., female Dall sheep.
- Busch Gardens, Tampa, Fla., male concave-casqued hornbill, female Solomon Islands cockatoo.
- Defense General Supply Center Preserve, Richmond, Va., male American elk.
- Round Lake Waterfowl Station, Round Lake, Minn., 31 cotton teals.
- St. Louis Zoo, St. Louis, Mo., male gaur, 4 king penguins, Adélie penguin, female chimpanzee.

EXCHANGES

The National Zoological Park continues a program of exchanging surplus animals with zoos of other countries. Notable exchange arrangements were negotiated with several foreign zoos. The West Berlin Zoo in Germany received 4 wood ducks, 2 turkey vultures, 2 whistling swans, 2 great horned owls, a red-tailed hawk, a red-shouldered hawk, and 2 barred owls. El Pinar Zoo in Caracas, Venezuela, received 2 American alligators, a pair of wood ducks, and a female Nile hippopotamus. The Calgary Zoo, Alberta, Canada, received 2 scarlet ibises, 2 roseate spoonbills, 2 cattle egrets, 2 eastern glossy ibises, 2 little blue herons, a Louisiana heron, a red-shouldered hawk, an osprey, 2 chimachimas, 2 crested curassows, an Ariel toucan, 2 barred owls, and 2 kookaburras. The Edinburgh Zoo in Scotland

received 6 raccoons, 1 jaguarondi, 2 squirrel monkeys, 2 kinkajous, 4 opossums, and 3 king snakes.

The exchange of specimens with zoos and institutions in the United States is also continuing. With the decrease in wild animal populations in various parts of the world, it becomes important to replace animal losses from stock propagated in other zoos. An actual surplus of any one kind of animal is best dissipated by distributing to other American zoos so that new displays and further propagation may be achieved.

Animals obtained through exchange were:

- Baltimore Zoo, Baltimore, Md., Grant's zebra.
 Bronx Zoo, New York, N.Y., cusimanse, European dormouse, 2 otters.
 Buffalo Zoo, Buffalo, N.Y., 5 timber rattlesnakes, 2 black garter snakes, 2 Blanding's turtles.
 Calgary Zoological Society, Alberta, Canada, 2 bald eagles.
 Cheyenne Mountain Zoo, Colorado Springs, Colo., 8 golden-mantled ground squirrels.
 Cincinnati Zoo, Cincinnati, Ohio, clouded leopard.
 Columbus Zoo, Columbus, Ohio, 2 golden eagles, king vulture.
 Franklin Park Zoo, Boston, Mass., 2 giant salamanders, puma.
 Hanson, Charles, Oak Harbor, Ohio, Arizona king snake, ground snake, 2 shovel-nosed snakes, California mountain king snake, hooded merganser, 3 sidewinder rattlesnakes, alligator lizard, Texas long-nosed snake, eastern massasauga.
 Houston Zoological Gardens, Houston, Tex., 6 blotched water snakes, 2 yellow-bellied water snakes, diamondback water snake, 2 coral snakes, 6 water moccasins, 5 rat snakes, 7 western rattlesnakes, 2 speckled king snakes, 3 Lindheimer's rat snakes.
 Hoxie Bardex Circus, Sarasota, Fla., wild hog.
 Kenefick, James H., Danielson, Conn., pygmy rattlesnake, 2 gopher tortoises.
 Lincoln Park Zoo, Chicago, Ill., brown lemur, ruffed lemur.
 Mortimer, Bill, Anaheim, Calif., rosy boa, chuckwalla.
 Norfolk Zoo, Norfolk, Va., 4 cottonmouth water moccasins, 2 common king snakes, brown water snake, rainbow snake, 2 canebrake rattlesnakes.
 San Diego Zoo, San Diego, Calif., Allen's swamp monkey (male).
 Tote-Em-In Zoo, Wilmington, N.C., 2 star tortoises, leopard, African scorpion, 4 African red-tail squirrels, puff adder, unidentified tortoise, tree shrew, 2 moustached marmosets, African python, Indian python, titi monkey.
 Zinner, Hermann, Vienna, Austria, 12 European vipers, 3 sand vipers, 3 Aesculapian snakes, 3 European water snakes, 14 European lizards, 5 European turtles, 2 sand boas.

The following animals were sent to other zoos and to private collectors in exchange:

- Air Force Institute of Pathology, Washington, D.C., water moccasin, Asiatic rat snake, many-banded krait, green palm viper, lesser Indian rat snake.
 Baltimore Zoo, Baltimore, Md., Nile hippopotamous, Grant's zebra.
 British Guiana Zoo, Georgetown, British Guiana, lion cub (female).
 Buck, Warren, Marlton, N.J., 4 Gelada baboons.
 Buffalo Zoo, Buffalo, N.Y., lesser panda, 2 Taiwan cobras.
 Busch Gardens, Tampa, Fla., 2 whistling swans.

- Cincinnati Zoo, Cincinnati, Ohio, 4 mallards, 4 wood ducks, 4 lesser scaups, 4 canvasbacks, ringneck duck, redhead duck, emu, 2 glossy ibises, 2 scarlet ibises, 3 snowy egrets, Bengal tiger, 2 European brown bear cubs.
- Emperor Valley Zoo, Port of Spain, Trinidad, genet, cacomistle, 2 California ground squirrels, kinkajou.
- Franklin Park Zoo, Boston, Mass., 2 black swans, 2 whistling swans, cavy.
- Fresno Zoo, Fresno, Calif., 3 cattle egrets.
- Hanson, Charles, Oak Harbor, Ohio, lesser Indian rat snake, Aesculapian snake, Taiwan habu, palm viper, krait, western cottonmouth moccasin.
- Hoxie Bardex Circus, Sarasota, Fla., 2 squirrel monkeys.
- Jimmy Morgan Zoo, Birmingham, Ala., 2 magpies.
- John Ball Zoological Park, Grand Rapids, Mich., 2 scarlet ibises, 2 curassows, 2 roseate spoonbills.
- Johns Hopkins University, Baltimore, Md., 4 canvasback ducks.
- Lincoln Park Zoo, Chicago, Ill., lemur catta, pair Barbary apes.
- Lincoln Park Zoo, Oklahoma City, Okla., 2 scarlet ibises.
- Mortimer, Bill, Anaheim, Calif., 2 baby Cook's tree boas, Aesculapian snake.
- National Institutes of Health, Bethesda, Md., 4 fat-tailed gerbils, alligator, Neumann's genet.
- Palmer, Harold C., Douglasville, Ga., squirrel monkey, kookaburra.
- Patuxent Wildlife Refuge, Laurel, Md., red-tailed hawk, 2 sparrow hawks, barn owl, 3 great horned owls, 4 barred owls, 12 wood thrushes, 9 buntings, warblers.
- San Diego Zoo, San Diego, Calif., Allen's swamp monkey (female).
- Southwick Game Farm, Blackstone, Mass., 2 axis deer.
- Zinner, Hermann, Vienna, Austria, Lindheimer's snake, 2 pilot black snakes, 3 bull snakes, timber rattler, 2 western diamondback rattlesnakes, 2 southern copperheads, 3 water moccasins, 25 anoles, spiny-tailed iguana, common iguana, speckled king snake, common king snake, 2 common water snakes, diamond-backed water snake, 3 broad-banded water snakes, yellow-bellied water snake, 3 blotched water snakes, 3 indigo snakes.

PURCHASES

The National Zoological Park has been fortunate in purchasing a wild Grevy zebra stallion from Africa. This animal is particularly valuable in that wild blood has been assured in the continued breeding program of the Grevy herd here in the zoo.

The same is true of a male Masai giraffe import. The reception of this animal completes a trio of these unusual animals, and it is hoped that they will produce fine offspring—important items in the program of the interchange of animals among zoos of the United States.

A monkey or baboon island is a great attraction to visitors to any zoo. With the hope of a new island exhibit to be built, 16 Gelada baboons from Ethiopia were purchased and are being acclimated as eventual inhabitants of an island exhibit. Geladas are among the most hardy of the primate family, and it is expected that these specimens will condition to year-round outdoor environment with minimum heat requirements for their well-being.

Other purchases of interest were:

6 lungfishes	2 olive baboons
3 cantils	2 South American wood rails
2 Mexican beaded lizards	1 wattled guan

STATUS OF THE COLLECTION, JUNE 30, 1963

Class	Orders	Families	Species or subspecies	Individuals
Mammals.....	12	47	238	646
Birds.....	20	67	343	1, 068
Reptiles.....	4	25	192	699
Amphibians.....	2	10	25	107
Fishes.....	4	10	23	66
Arthropods.....	3	4	4	77
Mollusks.....	1	1	1	30
Total.....	46	164	826	2, 693

In the following list of mammals, sex is given where known; 1.0 indicates one male, 0.1 indicates one female, 1.1 indicates one male and one female, etc.:

ANIMALS IN THE COLLECTION ON JUNE 30, 1963

MAMMALS

Family and common name	MONOTREMATA	Scientific name	Number
TACHYGLOSSIDAE:			
Echidna, or spiny anteater.....		<i>Tachyglossus aculeatus</i>	0.1
MARSUPIALIA			
DIDELPHIDAE:			
Opossum.....		<i>Didelphis marsupialis virginiana</i>	0.1
Murine opossum.....		<i>Marmosa</i> sp.....	0.1
Central American opossum.....		<i>Didelphis marsupialis</i>	2.0
DASYURIDAE:			
Tasmanian devil.....		<i>Sarcophilus harrisii</i>	1.0
PHALANGERIDAE:			
Sugar glider.....		<i>Petaurus breviceps</i>	1.1
Squirrel glider.....		<i>Petaurus norfolcensis</i>	2.4
PHASCOLOMIDAE:			
Hairy-nosed wombat.....		<i>Lasiorhinus latifrons</i>	2.0
Mainland wombat.....		<i>Wombatus hirsutus</i>	0.1
MACROPODIDAE:			
Tree kangaroo.....		<i>Dendrolagus matschiei</i>	1.0
Rat kangaroo.....		<i>Potorous</i> sp.....	1.2
INSECTIVORA			
ERINACEIDAE:			
European hedgehog.....		<i>Erinaceus europaeus</i>	2.1
African desert hedgehog.....		<i>Paracchinus</i> sp.....	0.1

Family and common name	PRIMATES	Scientific name	Number
Lemuridae:			
Ring-tailed lemur		<i>Lemur catta</i>	2.1
Brown lemur		<i>Lemur fulvus</i>	1.1
Lorisidae:			
Great galago		<i>Galago crassicaudatus</i>	1.1
Bushbaby		<i>Galago senegalensis zanzibaricus</i>	2.0
Common potto		<i>Perodicticus potto</i>	0.1
Cebidae:			
Douroucouli		<i>Aotus trivirgatus</i>	2.0
Titi monkey		<i>Callicebus cupreus</i>	1.0
Capuchin		<i>Cebus capucinus</i>	3.5
Weeping capuchin		<i>Cebus griseus</i>	1.0
White-faced saki		<i>Pithecia pithecia</i>	0.1
Squirrel monkey		<i>Saimiri sciureus</i>	2.3
Spider monkey		<i>Ateles geoffroyi</i>	1.5
Black spider monkey		<i>Ateles fusciceps</i>	1.5
Woolly monkey		<i>Lagothrix</i> sp.	1.1
Callithricidae:			
Pygmy marmoset		<i>Cebuella pygmaea</i>	1.0
Cottontop marmoset		<i>Saguinus oedipus</i>	1.0
Red-handed marmoset		<i>Saguinus midas</i>	0.1
Moustached tamarin		<i>Saguinus mystax</i>	1.1
Cercopithecoidea:			
Toque, or bonnet macaque		<i>Macaca sinica</i>	1.2
Philippine macaque		<i>Macaca philippinensis</i>	1.0
Crab-eating macaque		<i>Macaca irus</i>	0.1
Rhesus monkey		<i>Macaca mulatta</i>	3.1
Javan macaque		<i>Macaca irus mordax</i>	2.1
Formosan macaque		<i>Macaca cyclops</i>	1.1
Red-faced macaque		<i>Macaca speciosa</i>	0.1
Barbary ape		<i>Macaca sylvanus</i>	5.1
Moor macaque		<i>Macaca maurus</i>	0.1
Gray-cheeked mangabey		<i>Cercocebus albigena</i>	0.1
Agile mangabey		<i>Cercocebus agilis</i>	1.0
Golden-bellied mangabey		<i>Cercocebus chrysogaster</i>	1.0
Red-crowned mangabey		<i>Cercocebus torquatus</i>	1.1
Sooty mangabey		<i>Cercocebus fuliginosus</i>	3.1
Crested mangabey		<i>Cercocebus aterrimus</i>	1.0
Black-crested mangabey		<i>Cercocebus aterrimus</i>	1.1
Drill		<i>Mandrillus leucophaeus</i>	1.0
Olive baboon		<i>Papio anubis</i>	3.2
Gelada baboon		<i>Theropithecus gelada</i>	7.6
Chacma baboon		<i>Papio comatus</i>	1.0
Vervet guenon		<i>Cercopithecus aethiops</i>	1.0
Green guenon		<i>Cercopithecus aethiops</i>	3.2
Grivet guenon (color variant)		<i>Cercopithecus aethiops</i>	0.1
Moustached monkey		<i>Cercopithecus cephus</i>	1.2
Diana monkey		<i>Cercopithecus diana</i>	1.0
Roloway monkey		<i>Cercopithecus diana roloway</i>	0.1
DeBrazza's guenon		<i>Cercopithecus neglectus</i>	1.0
White-nosed guenon		<i>Cercopithecus nictitans</i>	0.1

Family and common name	Scientific name	Number
Cercopithecidae—Continued		
Lesser white-nosed guenon.....	<i>Cercopithecus petaurista</i>	1.0
Allen's swamp monkey.....	<i>Allenopithecus nigroviridis</i>	1.1
Spectacled, or Phayre's, langur.....	<i>Presbytis phayrei</i>	1.0
Hanuman, or entellus monkey.....	<i>Presbytis entellus</i>	0.1
Crested langur.....	<i>Presbytis cristatus</i>	1.0
Pongidae:		
White-handed gibbon.....	<i>Hylobates lar</i>	1.1
Wau-wau gibbon.....	<i>Hylobates moloch</i>	0.1
Hybrid gibbon.....	<i>Hylobates lar</i> × <i>H. sp.</i>	0.5
Siamang gibbon.....	<i>Symphalangus syndactylus</i>	1.0
Sumatran orangutan.....	<i>Pongo pygmaeus</i>	1.1
Bornean orangutan.....	<i>Pongo pygmaeus</i>	0.1
Chimpanzee.....	<i>Pan satyrus</i>	3.2
Lowland gorilla.....	<i>Gorilla gorilla</i>	2.1
EDENTATA		
Myrmecophagidae:		
Giant anteater.....	<i>Myrmecophaga tridactyla</i>	0.1
Bradypodidae:		
Two-toed sloth.....	<i>Choloepus didactylus</i>	3.4
Dasypodidae:		
Nine-banded armadillo.....	<i>Dasyppus novemcinctus</i>	0.1
RODENTIA		
Sciuridae:		
European red squirrel.....	<i>Sciurus vulgaris</i>	2.2
Gray squirrel, albino.....	<i>Sciurus carolinensis</i>	2.0
Tassel-eared, or Abert's squirrel.....	<i>Sciurus aberti</i>	1.0
Western fox squirrel.....	<i>Sciurus niger</i>	1.0
Indian palm squirrel.....	<i>Funambulus palmarum</i>	0.1
South African red squirrel.....	<i>Paraxerus palliatus</i>	1.2
Tri-colored squirrel.....	<i>Callosciurus prevosti</i>	0.1
Formosan tree squirrel.....	<i>Callosciurus erythraeus</i>	1.1
Woodchuck, or groundhog.....	<i>Marmota monax</i>	4.2
Prairie-dog.....	<i>Cynomys ludovicianus</i>	15
California ground squirrel.....	<i>Citellus beecheyi</i>	2.2
Washington ground squirrel.....	<i>Citellus washingtoni</i>	1.1
Golden-mantled ground squirrel.....	<i>Citellus lateralis</i>	2.4
Eastern chipmunk.....	<i>Tamias striatus</i>	1.1
Eastern chipmunk, albino.....	<i>Tamias striatus</i>	1.0
Yellow pine chipmunk.....	<i>Eutamias amoenus</i>	0.1
Townsend's chipmunk.....	<i>Eutamias townsendii</i>	1.0
Eastern flying squirrel.....	<i>Glaucomys volans</i>	2.3
Heteromyidae:		
Kangaroo rat.....	<i>Dipodomys sp.</i>	2.0
Castoridae:		
Beaver.....	<i>Castor canadensis</i>	3
Pedetidae:		
Cape jumping hare.....	<i>Pedetes capensis</i>	2.1
Cricetidae:		
White-footed mouse.....	<i>Peromyscus sp.</i>	1.3
East African maned rat.....	<i>Lophiomys ibeanus</i>	2.0

Family and common name	Scientific name	Number
Cricetidae—Continued		
Pine vole.....	<i>Microtus pinetorum</i>	1.0
Gerbil.....	<i>Gerbillus pyramidum</i>	0.1
Fat-tailed gerbil.....	<i>Pachyuromys duprasi</i>	3.3
Egyptian gerbil.....	<i>Gerbillus dasyurus</i>	0.1
Hairy-tailed jird.....	<i>Sekeetamys calurus</i>	0.1
Muridae:		
Egyptian spiny mouse.....	<i>Acomys cahirinus</i>	10.14
Egyptian spiny mouse.....	<i>Acomys dimidiatus</i>	6.10
Giant forest rat.....	<i>Cricetomys gambianus</i> ssp.....	1.0
Slender-tailed cloud rat.....	<i>Phloeomys cunningii</i>	1.0
Gliridae:		
Garden dormouse.....	<i>Eliomys quercinus</i>	0.1
Hystriidae:		
Malay porcupine.....	<i>Acanthion brachyura</i>	1.0
African porcupine.....	<i>Hystrix cristata</i>	2.4
Palawan porcupine.....	<i>Thecurus pumilus</i>	1.1
Caviidae:		
Patagonian cavy.....	<i>Dolichotis patagonum</i>	3.6
Dasyproctidae:		
Hairy-rumped agouti.....	<i>Dasyprocta prymnolopha</i>	2.1
Agouti, black phase.....	<i>Dasyprocta prymnolopha</i>	1.1
Acouchy.....	<i>Myoprocta acouchy</i>	1.0
Chinchillidae:		
Mountain viscacha.....	<i>Lagidium</i> sp.....	0.1
CARNIVORA		
Canidae:		
Dingo.....	<i>Canis familiaris dingo</i>	1.2
Coyote.....	<i>Canis latrans</i>	0.1
Common jackal.....	<i>Canis aurcus</i>	1.1
Timber wolf.....	<i>Canis lupus nubilus</i>	1.3
Texas red wolf.....	<i>Canis niger rufus</i>	0.1
Arctic fox.....	<i>Alopex lagopus</i>	1.0
Fennec.....	<i>Fennecus zerda</i>	1.1
Gray fox.....	<i>Urocyon cinereoargenteus</i>	1.2
Red fox.....	<i>Vulpes fulva</i>	1.0
Raccoon dog.....	<i>Nyctereutes procyonoides</i>	1.1
Cape hunting dog.....	<i>Lycaon pictus</i>	1.1
Ursidae:		
Spectacled bear.....	<i>Tremarctos ornatus</i>	1.0
Himalayan bear.....	<i>Selenarctos thibetanus</i>	0.1
Japanese black bear.....	<i>Selenarctos thibetanus japonicus</i>	1.0
Korean bear.....	<i>Selenarctos thibetanus ussuriensis</i>	1.1
European brown bear.....	<i>Ursus arctos</i>	1.2
Iranian brown bear.....	<i>Ursus arctos syriacus</i>	1.1
Grizzly bear.....	<i>Ursus horribilis</i>	1.1
Black bear.....	<i>Euarctos americanus</i>	1.1
Polar bear.....	<i>Thalarchos maritimus</i>	1.2
Hybrid bear.....	<i>Thalarchos maritimus</i> × <i>Ursus middendorffi</i>	2.2

Family and common name	Scientific name	Number
Ursidae—Continued		
Malayan sun bear	<i>Helarctos malayanus</i>	0.2
Sloth bear	<i>Melursus ursinus</i>	1.1
Procyonidae:		
Cacomistle	<i>Bassariscus astutus</i>	2.2
Raccoon	<i>Procyon lotor</i>	1.4
Raccoon, albino	<i>Procyon lotor</i>	0.1
Raccoon, black phase	<i>Procyon lotor</i>	1.0
Coatimundi	<i>Nasua nasua</i>	1.3
Red coatimundi	<i>Nasua nasua</i>	1.0
Peruvian coatimundi	<i>Nasua nasua dorsalis</i>	1.1
Kinkajou	<i>Potos flavus</i>	2.1
Olingo	<i>Bassaricyon gabbi</i>	1.0
Mustelidae:		
Marten	<i>Martes americana</i>	0.1
Fisher	<i>Martes pennanti</i>	0.1
British Guiana tayra	<i>Eira barbara poliocephala</i>	1.1
Grison	<i>Galictis allamandi</i>	1.0
Zorilla	<i>Ictonyx striatus</i>	1.0
Wolverine	<i>Gulo gulo luscus</i>	0.1
Ratel	<i>Mellivora capensis</i>	1.0
American badger	<i>Taxidea taxus</i>	1.0
Golden-bellied ferret-badger	<i>Melogale moschata subaurantiaca</i>	1.2
Common skunk	<i>Mephitis mephitis</i>	2.0
California spotted skunk	<i>Spilogale putorius phenax</i>	1.0
River otter	<i>Lutra canadensis</i>	2.0
Viverridae:		
Genet	<i>Genetta genetta neumanni</i>	2.5
Genet, black phase	<i>Genetta genetta</i>	1.0
Formosan spotted civet	<i>Viverricula indica</i>	1.1
Linsang	<i>Prionodon linsang</i>	0.1
African palm civet	<i>Nandinia binotata</i>	1.1
Formosan masked civet	<i>Paguma larvata taiwana</i>	1.0
Binturong	<i>Arctictis binturong</i>	1.0
African gray mongoose	<i>Herpestes ichneumon</i>	0.1
African water civet	<i>Atilax paludinosus</i>	1.4
African striped mongoose	<i>Crossarchus fasciatus</i>	1.1
Cusimanse	<i>Crossarchus sp.</i>	0.1
White-tailed mongoose	<i>Ichneumia albicauda</i>	1.0
Black-footed mongoose	<i>Bdeogale sp.</i>	1.1
Hyaenidae:		
Striped hyena	<i>Hyaena hyaena</i>	1.1
Felidae:		
Bobcat	<i>Lynx rufus</i>	1.1
Canadian lynx	<i>Lynx canadensis</i>	1.0
Caracal	<i>Lynx caracal caracal</i>	1.0
Jungle cat	<i>Felis chaus</i>	1.1
Pallas's cat	<i>Felis manul</i>	1.1
Serval	<i>Felis serval</i>	0.2
Leopard cat	<i>Felis bengalensis</i>	1.0
Golden cat	<i>Felis aurata</i>	1.0
Ocelot	<i>Felis pardalis</i>	1.2

Family and common name	Scientific name	Number
Felidae—Continued		
Jaguarondi.....	<i>Felis yagouaroundi</i>	1.1
Puma.....	<i>Felis concolor</i>	1.1
Leopard.....	<i>Panthera pardus</i>	3.1
Black leopard.....	<i>Panthera pardus</i>	1.2
Lion.....	<i>Panthera leo</i>	4.4
Bengal tiger.....	<i>Panthera tigris</i>	2.1
White Bengal tiger.....	<i>Panthera tigris</i>	0.1
Jaguar.....	<i>Panthera onca</i>	1.0
Clouded leopard.....	<i>Neofelis nebulosa</i>	2.0
Snow leopard.....	<i>Uncia uncia</i>	1.1
Cheetah.....	<i>Acinonyx jubata</i>	1.1
PINNIPEDIA		
Otariidae:		
California sea-lion.....	<i>Zalophus californianus</i>	3.3
Patagonian sea-lion.....	<i>Otaria flavescens</i>	0.1
Phocidae:		
Harbor seal.....	<i>Phoca vitulina</i>	1.1
TUBULIDENTATA		
Orycteropodidae:		
Aardvark.....	<i>Orycteropus afer</i>	1.0
PROBOSCIDEA		
Elephantidae:		
African elephant.....	<i>Loxodonta africana</i>	0.1
Forest elephant.....	<i>Loxodonta cyclotis</i>	1.0
Indian elephant.....	<i>Elephas maximus</i>	0.2
PERISSODACTYLA		
Equidae:		
Mongolian wild horse.....	<i>Equus przewalskii</i>	1.0
Grevy's zebra.....	<i>Equus grevyi</i>	1.2
Grant's zebra.....	<i>Equus burchelli</i>	1.3
Burro, or donkey.....	<i>Equus asinus</i>	1.0
Tapiridae:		
Brazilian tapir.....	<i>Tapirus terrestris</i>	1.1
Rhinocerotidae:		
Indian one-horned rhinoceros.....	<i>Rhinoceros unicornis</i>	1.0
African black rhinoceros.....	<i>Diceros bicornis</i>	1.1
White, or square-lipped, rhinoceros.....	<i>Ceratotherium simum</i>	1.1
ARTIODACTYLA		
Tayassuidae:		
Collared peccary.....	<i>Tayassu tajacu</i>	4.3
Hippopotamidae:		
Hippopotamus.....	<i>Hippopotamus amphibius</i>	1.1
Pygmy hippopotamus.....	<i>Choeropsis liberiensis</i>	1.4
Camelidae:		
Bactrian camel.....	<i>Camelus bactrianus</i>	0.1
Llama.....	<i>Lama glama</i>	2.4
Guanaco.....	<i>Lama glama guanicoe</i>	1.1
Alpaca.....	<i>Lama pacos</i>	1.1

Family and common name	Scientific name	Number
Cervidae:		
White fallow deer	<i>Dama dama</i>	3.3
Axis deer	<i>Axis axis</i>	3.2
Red deer	<i>Cervus elaphus</i>	4.3
Sika deer	<i>Cervus nippon</i>	3.11
Père David's deer	<i>Elaphurus davidianus</i>	1.0
White-tailed, or Virginia, deer	<i>Odocoileus virginianus</i>	2.6
American elk	<i>Cervus canadensis</i>	*1.0
Forest caribou	<i>Rangifer caribou</i>	0.1
Reindeer	<i>Rangifer tarandus</i>	3.11
Giraffidae:		
Nubian giraffe	<i>Giraffa camelopardalis</i>	0.1
Masai giraffe	<i>Giraffa c. tippelskirchi</i>	1.2
Bovidae:		
Sitatunga	<i>Tragelaphus spekii</i>	1.0
Anoa	<i>Anoa depressicornis</i>	1.1
Yak	<i>Poephagus grunniens</i>	1.3
Gaur	<i>Bibos gaurus</i>	2.0
Cape buffalo	<i>Syncerus caffer</i>	1.4
American bison	<i>Bison bison</i>	1.0
Brindled gnu	<i>Connochaetes taurinus</i>	1.4
Dorcas gazelle	<i>Gazella dorcas</i>	3.4
Saiga antelope	<i>Saiga tatarica</i>	0.1
Rocky Mountain goat	<i>Oreamnos americanus</i>	0.1
Himalayan tahr	<i>Hemitragus jemtahicus</i>	0.1
African pygmy goat	<i>Capra hircus</i>	3.2
Ibex	<i>Capra ibex</i>	1.0
Aoudad, or Barbary sheep	<i>Ammotragus lervia</i>	1.1
Dall sheep	<i>Ovis dalli</i>	*0.1
Big-horn sheep	<i>Ovis canadensis</i>	1.1

BIRDS

SPHENISCIFORMES

Spheniscidae:		
King penguin	<i>Aptenodytes patagonica</i>	*4
Adelie penguin	<i>Pygoscelis adeliae</i>	*1

STRUTHIONIFORMES

Struthionidae:		
Ostrich	<i>Struthio camelus</i>	1

RHEIFORMES

Rheidae:		
Rhea	<i>Rhea americana</i>	1

CASUARIIFORMES

Casuariidae:		
Double-wattled cassowary	<i>Casuarus bicarunculatus</i>	2
Dromicidae:		
Emu	<i>Dromiccius novaehollandiae</i>	2

*On deposit at another zoo or sanctuary.

TINAMIFORMES

Family and common name	Scientific name	Number
Tinamidae:		
Pileated tinamou.....	<i>Crypturellus soui panamensis</i>	1

PROCELLARIIFORMES

Diomedelidae:		
Black-footed albatross.....	<i>Diomedea nigripes</i>	2
Phaethontidae:		
Red-tailed tropicbird.....	<i>Phaethon rubicauda</i>	3

PELECANIFORMES

Pelecanidae:		
White pelican.....	<i>Pelecanus erythrorhynchos</i>	3
Brown pelican.....	<i>Pelecanus occidentalis</i>	1
Dalmatian pelican.....	<i>Pelecanus crispus</i>	2
Sulidae:		
Gannet.....	<i>Sula bassana</i>	1
Phalacrocoracidae:		
Double-crested cormorant.....	<i>Phalacrocorax auritus auritus</i>	3
	<i>Phalacrocorax auritus albocilli-</i>	
	<i>atus</i>	1
European cormorant.....	<i>Phalacrocorax carbo</i>	6

CICONIIFORMES

Ardeidae:		
Reddish egret.....	<i>Dichromanassa rufescens rufes-</i>	
	<i>cens</i>	8
Snowy egret.....	<i>Egretta thula</i>	3
Eastern green heron.....	<i>Butorides virescens</i>	2
Louisiana heron.....	<i>Hydranassa tricolor</i>	2
Black-crowned night heron.....	<i>Nycticorax nycticorax</i>	12
American bittern.....	<i>Botaurus lentiginosus</i>	1
Tiger bittern.....	<i>Tigrisoma lineatum</i>	1
Balaenicipitidae:		
Shoebill.....	<i>Balaeniceps rex</i>	1
Ciconiidae:		
American wood ibis.....	<i>Mycteria americana</i>	2
European white stork.....	<i>Ciconia ciconia</i>	4
White-bellied stork.....	<i>Sphenorhynchus abdimia</i>	2
Open-billed stork.....	<i>Anastomus oscitans</i>	1
Threskiornithidae:		
White ibis.....	<i>Guara alba</i>	2
Scarlet ibis.....	<i>Guara ruber</i>	2
Black-faced ibis.....	<i>Theristicus melanopis</i>	1
Black-headed ibis.....	<i>Threskiornis melanocephala</i>	1
White-faced glossy ibis.....	<i>Plegadis falcinellus mexicana</i>	1
Eastern glossy ibis.....	<i>Plegadis falcinellus falcinellus</i>	1
Phoenicopteridae:		
Chilean flamingo.....	<i>Phoenicopterus chilensis</i>	1
Cuban flamingo.....	<i>Phoenicopterus ruber</i>	1
Old World flamingo.....	<i>Phoenicopterus antiquorum</i>	1

Family and common name	ANSERIFORMES	Scientific name	Number
Anhimidae:			
Crested screamer		<i>Chauna torquata</i>	6
Anatidae:			
Coscoroba swan		<i>Coscoroba coscoroba</i>	4
Mute swan		<i>Cygnus olor</i>	3
Black-necked swan		<i>Cygnus melanocoryphus</i>	2
Whooper swan		<i>Olor cygnus</i>	4
Whistling swan		<i>Olor columbianus</i>	11
Trumpeter swan		<i>Olor buccinator</i>	2
Black swan		<i>Chenopsis atrata</i>	7
Egyptian goose		<i>Alopochen aegyptiacus</i>	4
White-fronted goose		<i>Anser albifrons</i>	3
Indian bar-headed goose		<i>Anser indicus</i>	5
Emperor goose		<i>Anser canagicus</i>	2
Blue goose		<i>Anser caerulescens</i>	6
Lesser snow goose		<i>Anser caerulescens caerulescens</i>	2
Greater snow goose		<i>Anser caerulescens atlanticus</i>	5
Ross's goose		<i>Anser rossii</i>	4
Nene, or Hawaiian goose		<i>Branta sandvicensis</i>	2
Red-breasted goose		<i>Branta ruficollis</i>	4
Canada goose		<i>Branta canadensis</i>	26
Lesser Canada goose		<i>Branta canadensis</i>	5
Giant Canada goose		<i>Branta canadensis major</i>	4
Cackling goose		<i>Branta canadensis</i>	4
White-cheeked goose		<i>Branta canadensis</i>	3
Canada goose × Lesser snow goose (blue phase), hybrid		<i>Branta canadensis</i> × <i>Anser caerulescens</i>	1
Fulvous tree duck		<i>Dendrocygna bicolor</i>	1
Ruddy shelduck		<i>Casarca ferruginae</i>	2
Wood duck		<i>Aix sponsa</i>	104
Mandarin duck		<i>Aix galericulata</i>	12
Indian cotton teal		<i>Nettapus coromandelianus</i>	*8
Pintail duck		<i>Anas acuta</i>	4
Green-winged teal		<i>Anas crecca</i>	1
Chestnut-breasted teal		<i>Anas castanea</i>	1
Gadwall		<i>Anas strepera</i>	4
European widgeon		<i>Anas penelope</i>	2
Mallard duck		<i>Anas platyrhynchos</i>	60
Mallard duck × American pintail duck, hybrid		<i>Anas platyrhynchos</i> × <i>Anas acuta</i>	1
Black duck		<i>Anas rubripes</i>	8
Greater scaup duck		<i>Aythya marila</i>	11
Lesser scaup duck		<i>Aythya affinis</i>	55
Redhead		<i>Aythya americana</i>	17
Ring-necked duck		<i>Aythya collaris</i>	18
Canvasback duck		<i>Aythya valisineria</i>	40
Rosy-billed pochard		<i>Metopiana peposaca</i>	1

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Family and common name	Scientific name	Number
Anatidae—Continued		
Red-crested pochard	<i>Netta rufina</i>	1
Bufflehead	<i>Bucephala albeola</i>	1
American goldeneye	<i>Bucephala clangula</i>	1
Baldpate	<i>Mareca americana</i>	8
Hooded merganser	<i>Lophodytes cucullatus</i>	1
FALCONIFORMES		
Cathartidae:		
Andean condor	<i>Vultur gryphus</i>	1
King vulture	<i>Sarcorampus papa</i>	1
Sagittariidae:		
Secretarybird	<i>Sagittarius serpentarius</i>	2
Accipitridae:		
Hooded vulture	<i>Necrosyrtes monachus</i>	1
Griffon vulture	<i>Gyps fulvus</i>	1
Rüppell's vulture	<i>Gyps ruppellii</i>	2
African yellow-billed kite	<i>Milvus migrans</i>	2
Brahminy kite	<i>Haliastur indus</i>	1
Black-faced hawk	<i>Leucopternis melanops</i>	1
Red-winged hawk	<i>Heterospizias meridionalis</i>	1
Red-tailed hawk	<i>Buteo jamaicensis</i>	1
Swainson's hawk	<i>Buteo swainsoni</i>	1
Mauduyt's hawk eagle	<i>Spizactus ornatus</i>	1
Black-crested eagle	<i>Lophaetus occipitalis</i>	1
Great black hawk	<i>Ictinaetus malayensis</i>	1
Golden eagle	<i>Aquila chrysaetos</i>	5
Imperial eagle	<i>Aquila heliaca</i>	2
White-breasted sea eagle	<i>Haliaeetus leucogaster</i>	1
Pallas's eagle	<i>Haliaeetus leucoryphus</i>	1
Bald eagle	<i>Haliaeetus leucocephalus</i>	9
Harpy eagle	<i>Harpia harpyja</i>	1
Guianan crested eagle	<i>Morphnus guianensis</i>	1
Martial eagle	<i>Polmaetus bellicosus</i>	1
Bateleur eagle	<i>Terathopus ecaudatus</i>	1
Lammergeier	<i>Gypaetus barbatus</i>	1
Falconidae:		
Sparrow hawk	<i>Falco sparverius</i>	4
Duck hawk	<i>Falco peregrinus anatum</i>	1
Feilden's falconet	<i>Neohierax cinereiceps</i>	1
Red-footed falcon	<i>Falco vespertinus</i>	1
Forest falcon	<i>Micrastur semitorquatus</i>	2
Chimango	<i>Milvago chimango</i>	1
Audubon's caracara	<i>Polyborus cheriway</i>	2
White-throated caracara	<i>Phalcoboenus albogularis</i>	1
CALLIFORMES		
Megapodiidae:		
Brush turkey	<i>Alectura lathamii</i>	1
Cracidae:		
Wattled curassow	<i>Crax globulosa</i>	2
White-headed piping guan	<i>Pipile cumanensis</i>	1
Wattled guan	<i>Pipile</i> sp.	1

Family and common name	Scientific name	Number
Phasianidae:		
Gambel's quail.....	<i>Lophortyx gambeli</i>	2
Valley quail.....	<i>Lophortyx californica vallicola</i> ..	3
Argus pheasant.....	<i>Argusianus argus</i>	1
Golden pheasant.....	<i>Chrysolophus pictus</i>	3
Red junglefowl.....	<i>Gallus gallus</i>	3
Black-backed kaleege pheasant.....	<i>Gennaeus melanonotus</i>	2
Silver pheasant.....	<i>Gennaeus nycthemerus</i>	1
Peafowl.....	<i>Pavo cristatus</i>	6
Ring-necked pheasant.....	<i>Phasianus colchicus</i>	1
Ring-necked pheasant, albino.....	<i>Phasianus colchicus</i>	2
Ring-necked pheasant X Green pheasant, hybrid.	<i>Phasianus colchicus</i> X <i>Phasianus versicolor</i> .	1
Bhutan, or grey peacock pheasant....	<i>Polyplectron bicalcaratum</i>	1
Numididae:		
Vulturine guineafowl.....	<i>Acryllium vulturinum</i>	1
GRUIFORMES		
Gruidae:		
Siberian crane.....	<i>Grus leucogeranus</i>	1
European crane.....	<i>Grus grus</i>	2
Demoiselle crane.....	<i>Anthropoides virgo</i>	4
Sarus crane.....	<i>Grus antigone</i>	1
African crowned crane.....	<i>Balearica pavonina</i>	5
Psophiidae:		
Trumpeter.....	<i>Psophia crepitans</i>	1
Rallidae:		
Cayenne wood rail.....	<i>Aramides cajanea</i>	1
Virginia rail.....	<i>Rallus limicola</i>	1
Purple gallinule.....	<i>Porphyryula martinica</i>	2
Eurypygidae:		
Sun bittern.....	<i>Eurypyga helias</i>	1
Cariamidae:		
Cariama, or seriama.....	<i>Cariama cristata</i>	1
Otididae:		
Kori bustard.....	<i>Eupodotis kori</i>	2
Senegal bustard.....	<i>Eupodotis senegalensis</i>	1
CHARADRIIFORMES		
Jacanidae:		
Common jaçana.....	<i>Jacana spinosa</i>	2
Haematopodidae:		
Oystercatcher.....	<i>Haematopus ostralegus</i>	1
Charadriidae:		
Australian banded plover.....	<i>Zonifer tricolor</i>	2
European lapwing.....	<i>Vanellus vanellus</i>	3
South American lapwing.....	<i>Belonopterus cayennensis</i>	4
Crocodile bird.....	<i>Pluvianus aegyptius</i>	7
Recurvirostridae:		
Black-necked stilt.....	<i>Himantopus mexicanus</i>	1
Laridae:		
Ring-billed gull.....	<i>Larus delawarensis</i>	3
Kelp gull.....	<i>Larus dominicanus</i>	2

Family and common name	Scientific name	Number
Laridae—Continued		
Laughing gull.....	<i>Larus atricilla</i>	3
Herring gull.....	<i>Larus argentatus</i>	1
Great black-backed gull.....	<i>Larus marinus</i>	1
Silver gull.....	<i>Larus novae-hollandiae</i>	6

COLUMBIFORMES

Columbidae:		
Band-tailed pigeon.....	<i>Columba fasciata</i>	1
High-flying Budapest pigeon.....	<i>Columba livia</i>	1
Black-billed pigeon.....	<i>Columba nigrirostris</i>	1
Triangular spotted pigeon.....	<i>Columba guinea</i>	2
Crowned pigeon.....	<i>Goura victoria</i>	1
Blue ground dove.....	<i>Claravis pretiosa</i>	4
Ruddy ground dove.....	<i>Chaemepelia rufipennis</i>	1
Indian emerald-winged tree dove.....	<i>Chalcophaps indica</i>	5
Diamond dove.....	<i>Geopelia cuneata</i>	1
Plain-breasted ground dove.....	<i>Columbigallina minuta</i>	2
Ground dove.....	<i>Columbigallina passerina</i>	1
Ring-necked dove.....	<i>Streptopelia decaocto</i>	5
Blue-headed ring dove.....	<i>Streptopelia tranquebarica</i>	2
White-winged dove.....	<i>Zenaida asiatica</i>	1
Mourning dove.....	<i>Zenaidura macroura</i>	1

PSITTACIFORMES

Psittacidae:		
Kea parrot.....	<i>Nestor notabilis</i>	2
Banksian cockatoo.....	<i>Calyptorhynchus magnificus</i>	1
White cockatoo.....	<i>Kakatoe alba</i>	1
Solomon Islands cockatoo.....	<i>Kakatoe ducrops</i>	*1
Sulphur-crested cockatoo.....	<i>Kakatoe galerita</i>	2
Bare-eyed cockatoo.....	<i>Kakatoe sanguinea</i>	3
Great red-crested cockatoo.....	<i>Kakatoe moluccensis</i>	1
Leadbeater's cockatoo.....	<i>Kakatoe leadbeateri</i>	6
Cockatiel.....	<i>Nymphicus hollandicus</i>	5
Yellow-and-blue macaw.....	<i>Ara araurauna</i>	4
Red-and-blue macaw.....	<i>Ara chloroptera</i>	2
Red-blue-and-yellow macaw.....	<i>Ara macao</i>	2
Illiger's macaw.....	<i>Ara maracana</i>	2
Brown-throated conure.....	<i>Conurus aeruginosus</i>	8
Petz's parakeet.....	<i>Aratinga canicularis</i>	2
Rusty-cheeked parrot.....	<i>Aratinga pertinax</i>	2
Yellow-naped parrot.....	<i>Amazona auropalliata</i>	2
Finsch's parrot.....	<i>Amazona finschi</i>	1
Blue-fronted parrot.....	<i>Amazona aestiva</i>	1
Red-fronted parrot.....	<i>Amazona bodini</i>	1
Double yellow-headed parrot.....	<i>Amazona oratrix</i>	4
African gray parrot.....	<i>Psittacus erithacus</i>	4
Black-headed, or Nanday, parrot.....	<i>Nandayus nanday</i>	7
Lineolated parakeet.....	<i>Bolborhynchus lineolatus</i>	5
White-winged parakeet.....	<i>Brotogeris versicolorus</i>	1
Tovi parakeet.....	<i>Brotogeris jugularis</i>	1

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Family and common name	Scientific name	Number
Psittacidae—Continued		
Greater ring-necked parakeet.....	<i>Psittacula eupatria</i>	2
Rose-breasted parakeet.....	<i>Psittacula alexandri</i>	1
Moustached parakeet.....	<i>Psittacula fasciata</i>	1
Lesser ring-necked parakeet.....	<i>Psittacula krameri</i>	2
Barraband's parakeet.....	<i>Polytelis swainsoni</i>	1
Quaker parakeet.....	<i>Myiopsitta monacha</i>	7
Grass parakeet.....	<i>Melopsittacus undulatus</i>	1
Red-faced lovebird.....	<i>Agapornis pullaria</i> ssp.....	2
Rosy-faced lovebird.....	<i>Agapornis roseicollis</i>	1
Black-headed caique, or seven-color parrot.....	<i>Pionites melanocephala</i>	2
Yellow-thighed caique.....	<i>Pionites leucogaster</i>	1
CUCULIFORMES		
Musophagidae:		
White-bellied go-away bird.....	<i>Crinifer leucogaster</i>	1
Plantain-eater.....	<i>Crinifer africanus</i>	1
Cuculidae:		
Koel.....	<i>Eudynamis scolopacea</i>	1
Roadrunner.....	<i>Geococcyx californianus</i>	2
Coucal, or crow-pheasant.....	<i>Centropus sinensis</i>	1
STRIGIFORMES		
Tytonidae:		
Barn owl.....	<i>Tyto alba</i>	1
Strigidae:		
Screech owl.....	<i>Otus asio</i>	3
Spectacled owl.....	<i>Pulsatrix perspicillata</i>	1
Malay fishing owl.....	<i>Ketupa ketupu</i>	1
Snowy owl.....	<i>Nyctea nyctea</i>	4
Barred owl.....	<i>Strix varia</i>	1
Burrowing owl.....	<i>Speotyto cunicularia hypugaea</i>	2
Nepal brown wood owl.....	<i>Strix leptogrammica newarensis</i>	1
CORACIFORMES		
Alcedinidae:		
Kookaburra.....	<i>Dacelo gigas</i>	16
Coraciidae:		
Lilac-breasted roller.....	<i>Coracias caudata</i>	2
Indian roller.....	<i>Coracias benghalensis</i>	2
Bucerotidae:		
Concave-casqued hornbill.....	<i>Buceros bicornis</i>	*1
Pied hornbill.....	<i>Anthracoceros malabaricus</i>	1
Abyssinian ground hornbill.....	<i>Bucorvus abyssinicus</i>	2
Leadbeater's ground hornbill.....	<i>Bucorvus leadbeateri</i>	1
Grey hornbill.....	<i>Tockus birostris</i>	1
Great black-casqued hornbill.....	<i>Certaogymna atrata</i>	1
Crowned hornbill.....	<i>Tockus alboterminatus</i>	1
Yellow-billed hornbill.....	<i>Tockus flavirostris</i>	1

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Family and common name	PICIFORMES	Scientific name	Number
Capitonidae:			
Asiatic great barbet.....		<i>Megalaima virens</i>	1
Toucan barbet.....		<i>Semnornis ramphastinus</i>	1
Ramphastidae:			
Keel-billed toucan.....		<i>Ramphastos culminatus</i>	2
Sulphur-and-white-breasted toucan.....		<i>Ramphastos vitellinus</i>	1
Razor-billed toucanet.....		<i>Pteroglossus castanotis</i>	2
PASSERIFORMES			
Tyrannidae:			
Kiskadee flycatcher.....		<i>Pitangus sulphuratus</i>	4
Eastern kingbird.....		<i>Tyrannus tyrannus</i>	1
Alaudidae:			
Horned lark.....		<i>Eremophila alpestris</i>	1
Corvidae:			
Magpie.....		<i>Pica pica</i>	1
Yellow-billed magpie.....		<i>Pica nuttalli</i>	1
Asiatic tree pie.....		<i>Crypsirina formosae</i>	1
Magpie jay.....		<i>Calocitta formosa</i>	1
European jay.....		<i>Garrulus glandarius</i>	2
African white-necked crow.....		<i>Corvus albus</i>	2
American crow.....		<i>Corvus brachyrhynchos</i>	1
Raven.....		<i>Corvus corax principalis</i>	2
Indian crow.....		<i>Corvus splendens</i>	1
Formosan red-billed pie.....		<i>Cissa caerulea</i>	9
Occipital blue pie.....		<i>Cissa occipitalis</i>	1
Hunting crow.....		<i>Cissa chinensis</i>	1
Inca jay.....		<i>Xanthoura yncas</i>	1
Paridae:			
Great tit.....		<i>Parus major</i>	1
Timallidae:			
White-capped redstart.....		<i>Chaimarrornis leucocephalus</i>	1
Red-eyed babbler.....		<i>Chrysomma sinense</i>	1
Scimitar babbler.....		<i>Pomatorhinus schisticeps</i>	1
White-crested laughing thrush.....		<i>Garrulax bicolor</i>	4
Black-headed sibia.....		<i>Heterophasia capistrata</i>	2
Silver-eared mesia.....		<i>Mesia argentauris</i>	3
Pekin robin.....		<i>Leiothrix luteus</i>	5
Pycnonotidae:			
Red-eared bulbul.....		<i>Pycnonotus jocosus</i>	1
Black-headed bulbul.....		<i>Pycnonotus atriceps</i>	2
Red-vented bulbul.....		<i>Pycnonotus cafer</i>	4
White-cheeked bulbul.....		<i>Pycnonotus leucogenys</i>	3
White-eared bulbul.....		<i>Pycnonotus leucotis</i>	1
Turdidae:			
Robin, albino.....		<i>Turdus migratorius</i>	1
European song thrush.....		<i>Turdus ericetorum</i>	2
Blackbird.....		<i>Turdus merula</i>	1
Cliff chat.....		<i>Thamnota cinnamomeiventris</i>	1
Bombycillidae:			
Cedar waxwing.....		<i>Bombycilla cedrorum</i>	1

Family and common name	Scientific name	Number
Sturnidae:		
Rose-colored pastor	<i>Pastor roseus</i>	1
Purple starling	<i>Lamprocolius purpureus</i>	3
Burchell's long-tailed starling	<i>Lamprotornis caudatus</i>	1
Amethyst starling	<i>Cinnyricinclus leucogaster</i>	1
Tri-colored starling	<i>Spreo superbus</i>	1
Jungle mynah	<i>Acridotheres tristis</i>	1
Lesser hill mynah	<i>Gracula religiosa indica</i>	3
Greater Indian hill mynah	<i>Gracula religiosa intermedia</i>	2
Nectariniidae:		
Variable sunbird	<i>Cinnyris venustus raceis</i>	1
Scarlet-tufted malachite sunbird	<i>Nectarinia johnstoni</i>	1
Beautiful sunbird	<i>Nectarinia pulchella</i>	1
Purple sunbird	<i>Nectarinia asiatica</i>	1
Zosteropidae:		
White-eye	<i>Zosterops palpebrosa</i>	2
Chloropseidae:		
Blue-winged fruit-sucker	<i>Chloropsis hardwickei</i>	2
Coerebidae:		
Black-headed sugarbird	<i>Chlorophanes spiza</i>	2
Bananaquit	<i>Coereba flaveola</i>	1
Parulidae:		
Kentucky warbler	<i>Oporornis formosus</i>	1
Redstart	<i>Setophaga ruticilla</i>	1
Ovenbird	<i>Seiurus aurocapillus</i>	1
Ploceidae:		
Red-naped widowbird	<i>Coliuspasser laticauda</i>	4
Giant whydah	<i>Diatropura procne</i>	1
Baya weaver	<i>Ploceus baya</i>	3
Vitelline masked weaver	<i>Ploceus vitellinus</i>	1
Red bishop weaver	<i>Euplectes orix</i>	1
White-headed nun	<i>Lonchura maja</i>	2
Indian silverbill	<i>Lonchura malabarica</i>	1
Bengalese finch	<i>Lonchura sp.</i>	3
Cut-throat weaver finch	<i>Amadina fasciata</i>	1
Lavender finch	<i>Estrilda coerulescens</i>	1
Strawberry finch	<i>Estrilda amandava</i>	1
Common waxbill	<i>Estrilda troglodytes</i>	1
Zebra finch	<i>Poephila castanotis</i>	7
Gouldian finch	<i>Poephila gouldiae</i>	1
Icteridae:		
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	1
Rice grackle	<i>Psomocolax oryzivora</i>	2
Swainson's grackle	<i>Holoquiscalus lugubris</i>	1
Glossy cowbird	<i>Molothrus bonariensis</i>	2
Brown-headed cowbird	<i>Molothrus ater</i>	1
Bay cowbird	<i>Molothrus badius</i>	1
Colombian red-eyed cowbird	<i>Tangavius armenti</i>	1
Red-winged blackbird	<i>Agelaius phoeniceus</i>	2
Red-breasted marshbird	<i>Leistes militaris</i>	4

Family and common name	Scientific name	Number
Thraupidae:		
Palm tanager.....	<i>Tanagra palmarum</i>	1
Blue tanager.....	<i>Thraupis cana</i>	1
White-edged tanager.....	<i>Thraupis leucoptera</i>	1
Yellow-rumped tanager.....	<i>Ramphocelus icteronotus</i>	1
Passerini's tanager.....	<i>Ramphocelus passerinii</i>	1
Maroon, or silver-beaked, tanager.....	<i>Ramphocelus jacapa</i>	2
Fringillidae:		
Tropical seed finch.....	<i>Oryzoborus torridus</i>	2
Rice grosbeak.....	<i>Oryzoborus crassirostris</i>	1
Evening grosbeak.....	<i>Hesperiphona vespertina</i>	1
Black-throated cardinal.....	<i>Paroaria gularis</i>	3
Cardinal.....	<i>Richmondia cardinalis</i>	1
European linnet.....	<i>Acanthis cannabina</i>	1
European goldfinch.....	<i>Carduelis carduelis</i>	1
Green finch.....	<i>Chloris chloris</i>	1
Lesser yellow finch.....	<i>Sicalis luteola</i>	1
Saffron finch.....	<i>Sicalis flaveola</i>	3
White-lined finch.....	<i>Spermophila lineola</i>	4
Slate-colored junco.....	<i>Junco hyemalis</i>	1
Buff-throated saltator.....	<i>Saltator maximus</i>	1
Tawny-bellied seedeater.....	<i>Sporophila minuta</i>	5
Song sparrow.....	<i>Melospiza melodia</i>	1
Dickcissel.....	<i>Spiza americana</i>	3
White-crowned sparrow.....	<i>Zonotrichia leucophrys</i>	2
Yellowhammer.....	<i>Emberiza citrinella</i>	1
European bunting.....	<i>Emberiza calandra</i>	1
Jacarini finch.....	<i>Volatinia jacarini</i>	4

REPTILES

LORICATA

Alligatoridae:		
Caiman.....	<i>Caiman sclerops</i>	4
Black caiman.....	<i>Melanosuchus niger</i>	7
American alligator.....	<i>Alligator mississippiensis</i>	17
Chinese alligator.....	<i>Alligator sinensis</i>	2
Crocodylidae:		
Broad-nosed crocodile.....	<i>Osteolaemus tetraspis</i>	2
African crocodile.....	<i>Crocodylus niloticus</i>	3
Narrow-nosed crocodile.....	<i>Crocodylus cataphractus</i>	1
Salt-water crocodile.....	<i>Crocodylus porosus</i>	1
American crocodile.....	<i>Crocodylus acutus</i>	1
Gavialidae:		
Indian gavial.....	<i>Gavialis gangeticus</i>	1

CHELONIA

Chelydridae:		
Snapping turtle.....	<i>Chelydra serpentina</i>	13
Alligator snapping turtle.....	<i>Macrochelys temminckii</i>	1
Kinosternidae:		
Musk turtle.....	<i>Sternotherus odoratus</i>	4
Mud turtle.....	<i>Kinosternon subrubrum</i>	5
South American mud turtle.....	<i>Kinosternon cruentatum</i>	1

Family and common name	Scientific name	Number
Emydidae:		
Box turtle.....	<i>Terrapene carolina</i>	63
Three-toed box turtle.....	<i>Terrapene carolina triunguis</i>	2
Ornate box turtle.....	<i>Terrapene ornata ornata</i>	1
Florida box turtle.....	<i>Terrapene bauri</i>	5
Kura kura box turtle.....	<i>Cuora amboinensis</i>	2
Diamondback turtle.....	<i>Malaclemys terrapin</i>	6
Map turtle.....	<i>Graptemys geographica</i>	1
Mississippi map turtle.....	<i>Graptemys kohni</i>	3
Barbour's map turtle.....	<i>Graptemys barbouri</i>	4
Painted turtle.....	<i>Chrysemys picta</i>	10
Western painted turtle.....	<i>Chrysemys picta belli</i>	12
Southern painted turtle.....	<i>Chrysemys dorsalis</i>	1
Cumberland turtle.....	<i>Pseudemys troostii</i>	7
South American red-lined turtle.....	<i>Pseudemys scripta callirostris</i>	2
Yellow-bellied turtle.....	<i>Pseudemys scripta scripta</i>	18
Red-bellied turtle.....	<i>Pseudemys rebriventris</i>	8
Red-eared turtle.....	<i>Pseudemys scripta elegans</i>	33
Southern water turtle.....	<i>Pseudemys floridana</i>	7
Florida red-bellied turtle.....	<i>Pseudemys nelsoni</i>	2
Central American turtle.....	<i>Pseudemys ornata</i>	2
Cuban water turtle.....	<i>Pseudemys decussata</i>	1
Chicken turtle.....	<i>Deirochelys reticularia</i>	2
Spotted turtle.....	<i>Clemmys guttata</i>	2
Wood turtle.....	<i>Clemmys insculpta</i>	5
Iberian pond turtle.....	<i>Clemmys leprosa</i>	2
European water terrapin.....	<i>Clemmys caspica rivulata</i>	13
European pond turtle.....	<i>Emys orbicularis</i>	3
Blanding's, or semi-box, turtle.....	<i>Emys blandingii</i>	3
Reeves's turtle.....	<i>Chincemys reevesii</i>	4
Testudinidae:		
Duncan Island tortoise.....	<i>Testudo ephippium</i>	2
Galapagos tortoise.....	<i>Testudo vicina</i>	2
Galapagos tortoise.....	<i>Testudo elephantopus</i>	1
Giant Aldabra tortoise.....	<i>Testudo elephantina</i>	2
South American tortoise.....	<i>Testudo denticulata</i>	5
Star tortoise.....	<i>Testudo elegans</i>	2
Mountain tortoise.....	<i>Testudo emys</i>	2
Hermann's tortoise.....	<i>Testudo hermanni</i>	1
Gopher tortoise.....	<i>Gopherus polyphemus</i>	2
Texas gopher tortoise.....	<i>Gopherus berlandieri</i>	1
Pelomedusidae:		
African water turtle.....	<i>Pelusios sinuatus</i>	2
African black mud turtle.....	<i>Pelusios subniger</i>	1
Amazon spotted turtle.....	<i>Podocnemis unifilis</i>	4
Chelydidae:		
Southern American side-necked turtle.....	<i>Batrachemys nasuta</i>	2
Australian side-necked turtle.....	<i>Chelodina longicollis</i>	3
Matamata turtle.....	<i>Chelys fimbriata</i>	2
Small side-necked turtle.....	<i>Hydromedusa tectifera</i>	2
Large side-necked turtle.....	<i>Phrynops hilarii</i>	7

Family and common name	Scientific name	Number
Chelydidae—Continued		
Kreff's turtle	<i>Emydura krefftii</i>	3
Murray turtle	<i>Emydura macquarrii</i>	3
South American gibba turtle	<i>Mesoclemmys gibba</i>	2
Flat-headed turtle	<i>Platemys platycephala</i>	2
Trionychidae:		
Southern soft-shelled turtle	<i>Trionyx ferox</i>	4
Texas soft-shelled turtle	<i>Trionyx emoryi</i>	1
African soft-shelled turtle	<i>Trionyx triunguis</i>	2
SAURIA		
Gekkonidae:		
Tokay gecko	<i>Gekko gekko</i>	21
Day gecko	<i>Phelsuma cepedianum</i>	2
Day gecko	<i>Phelsuma</i> sp.	2
Iguanidae:		
Common iguana	<i>Iguana iguana</i>	2
Carolina anole	<i>Anolis carolinensis</i>	75
Texas horned lizard	<i>Phrynosoma cornutum</i>	1
Crevice spiny lizard	<i>Sceloporus poinsetti</i>	2
Spiny-tailed iguana	<i>Ctenosaura acanthura</i>	2
Agamidae:		
Agamid lizard	<i>Hoplurus sasicola</i>	1
Scincidae:		
Mourning skink	<i>Egernia luctuosa</i>	2
White's skink	<i>Egernia whitei</i>	3
Greater five-lined skink	<i>Eumeces fasciatus</i>	1
Great Plains skink	<i>Eumeces obsoletus</i>	2
Stump-tailed skink	<i>Tiliqua rugosa</i>	1
Malayan skink	<i>Mabuya multifasciata</i>	2
Gerrhosauridae:		
African plated lizard	<i>Zonosaurus</i> sp.	2
Madagascar plated lizard	<i>Zonosaurus madagascariensis</i>	2
Plated lizard	<i>Gerrhosaurus major</i>	1
Lacertidae:		
European lizard	<i>Lacerta strigata trilineata</i>	1
European green lizard	<i>Lacerta viridis</i>	3
European lizard	<i>Lacerta erhardtii</i>	1
European wall lizard	<i>Lacerta muralis</i>	1
Teiidae:		
Amelva lizard	<i>Ameiva ameiva praesignis</i>	1
Yellow tegu	<i>Tupinambis teguixin</i>	2
Whip-tailed lizard	<i>Cnemidophorus tigris</i>	1
Teiid lizard	<i>Cnemidophorus</i> sp.	1
Cordylidae:		
South African spiny lizard	<i>Cordylus vandami perkoensis</i>	2
Varanidae:		
Duméril's monitor	<i>Varanus dumerili</i>	2
Malayan monitor	<i>Varanus salvator</i>	1
Philippine monitor	<i>Varanus nuchalis</i>	2
Helodermatidae:		
Mexican beaded lizard	<i>Heloderma horridum</i>	3
Beaded lizard, black phase	<i>Heloderma horridum atvernensis</i>	1

<i>Family and common name</i>	<i>Scientific name</i>	<i>Number</i>
Anguidae:		
Glass lizard.....	<i>Ophisaurus ventralis</i>	3
European glass lizard.....	<i>Ophisaurus apodus</i>	2
SERPENTES		
Boidae:		
Anaconda.....	<i>Eunectes murinus</i>	1
Cook's tree boa.....	<i>Corallus enydris cooki</i>	4
Emerald tree boa.....	<i>Corallus caninus</i>	1
Boa constrictor.....	<i>Constrictor constrictor</i>	4
Emperor boa.....	<i>Constrictor imperator</i>	1
Cuban ground boa.....	<i>Tropidophis melanura</i>	1
Rainbow boa.....	<i>Epicrates cenchria</i>	3
Cuban tree boa.....	<i>Epicrates angulifer</i>	3
Sand boa.....	<i>Eryx conica</i>	3
Ball python.....	<i>Python regius</i>	2
Indian rock python.....	<i>Python molurus</i>	3
Regal python.....	<i>Python reticulatus</i>	4
African python.....	<i>Python sebae</i>	1
Acrochordidae:		
Elephant trunk snake.....	<i>Acrochordus javanicus</i>	1
Colubridae:		
King snake.....	<i>Lampropeltis getulus getulus</i>	2
Speckled king snake.....	<i>Lampropeltis getulus holbrooki</i>	2
California king snake.....	<i>Lampropeltis getulus californiae</i>	1
Florida king snake.....	<i>Lampropeltis getulus floridae</i>	2
Sonoran king snake.....	<i>Lampropeltis getulus splendida</i>	1
Scarlet king snake.....	<i>Lampropeltis triangulum doliata</i>	1
Milk snake.....	<i>Lampropeltis triangulum</i>	1
Tropical king snake.....	<i>Lampropeltis polyzona</i>	1
Garter snake.....	<i>Thamnophis sirtalis sirtalis</i>	2
Garter snake, melanistic phase.....	<i>Thamnophis sirtalis</i>	4
Ribbon snake.....	<i>Thamnophis sauritus</i>	1
Eastern hognosed snake.....	<i>Heterodon platyrhinos</i>	1
Common water snake.....	<i>Natrix sipedon</i>	2
Red-bellied water snake.....	<i>Natrix erythrogaster</i>	1
European grass snake.....	<i>Natrix natrix natrix</i>	5
Brazos water snake.....	<i>Natrix harteri</i>	1
Water snake.....	<i>Natrix harteri paucimaculata</i>	2
Diamondback water snake.....	<i>Natrix rhombifera</i>	4
Queen snake.....	<i>Natrix septemvittata</i>	1
Brown water snake.....	<i>Natrix taxipilota</i>	1
Broad-banded water snake.....	<i>Natrix confluens</i>	6
Blotched water snake.....	<i>Natrix transversa</i>	12
Yellow-bellied water snake.....	<i>Natrix flavigaster</i>	5
Indigo snake.....	<i>Drymarchon couperi</i>	1
Western indigo snake.....	<i>Drymarchon erebennus</i>	1
Pilot black snake.....	<i>Elaphe obsoleta obsoleta</i>	2
Pilot black snake, albino.....	<i>Elaphe obsoleta obsoleta</i>	1
Corn snake.....	<i>Elaphe obsoleta guttata</i>	1
Corn snake, albino.....	<i>Elaphe obsoleta guttata</i>	1
Fox snake.....	<i>Elaphe vulpina</i>	1

Family and common name	Scientific name	Number
Colubridae—Continued		
Formosan striped rat snake	<i>Elaphe taeniura</i>	5
Lindheimer's snake	<i>Elaphe lindheimeri</i>	2
Great Plains rat snake	<i>Elaphe emoryi</i>	1
Chicken snake	<i>Elaphe quadrivittata</i>	1
Aesculapian snake	<i>Elaphe longissima</i>	4
Aesculapian snake	<i>Elaphe longissima subgrisea</i>	1
Rainbow snake	<i>Abastor erythrogrammus</i>	1
Formosan cat-eyed snake	<i>Dinodon rufozonatum</i>	4
Cat-eyed snake	<i>Leptodeira annulata</i>	1
Black racer	<i>Coluber constrictor constrictor</i>	1
European racer	<i>Coluber jugularis caspius</i>	2
Red racer	<i>Masticophis flagellum frenatum</i>	1
Eastern coachwhip	<i>Masticophis flagellum</i>	1
Western coachwhip	<i>Masticophis flagellum testaceus</i>	2
Ring-necked snake	<i>Diadophis punctatus edwardsii</i>	1
Eastern worm snake	<i>Carphophis amoenus</i>	1
DeKay's snake	<i>Storeria dekayi</i>	1
Green whip snake	<i>Dryophis prasinus</i>	1
Bull snake	<i>Pituophis sayi</i>	2
Florida pine snake	<i>Pituophis mugitus</i>	1
Great Basin gopher snake	<i>Pituophis catenifer deserticola</i>	1
File snake	<i>Simocephalus capensis</i>	1
Wolf snake	<i>Lycodon flavomaculatus</i>	1
Cat-eyed snake	<i>Eteirodipsas</i> sp.	1
Green-headed tree snake	<i>Leptophis mexicanus</i>	1
Bronze vine snake	<i>Oxybelis aeneus</i>	1
Elapidae:		
Coral snake	<i>Micrurus tenere</i>	1
Indian cobra	<i>Naja naja</i>	1
Taiwan cobra	<i>Naja naja atra</i>	11
King cobra	<i>Ophiophagus hannah</i>	2
Many-banded krait	<i>Bungarus multicinctus</i>	4
Crotalidae:		
Southern copperhead	<i>Ancistrodon contortrix contortrix</i>	5
Northern copperhead	<i>Ancistrodon contortrix mokesoni</i>	2
Broad-banded copperhead	<i>Ancistrodon contortrix laticinctus</i>	1
Cottonmouth water moccasin	<i>Ancistrodon piscivorus</i>	3
Western water moccasin	<i>Ancistrodon leucostoma</i>	9
Cantil	<i>Ancistrodon bilineatus</i>	3
Eastern massasauga	<i>Sistrurus catenatus catenatus</i>	1
Pygmy rattlesnake	<i>Sistrurus miliarius</i>	1
Green palm viper	<i>Trimeresurus gramineus</i>	1
Green palm viper	<i>Trimeresurus stejnegeri</i>	1
Mamushi	<i>Trimeresurus elegans</i>	1
Habu	<i>Trimeresurus flavoviridis</i>	2
Taiwan habu	<i>Trimeresurus okinavensis</i>	1
Western diamondback rattlesnake	<i>Crotalus atrox</i>	8
Timber rattlesnake	<i>Crotalus horridus</i>	4
Viperidae:		
Puff adder	<i>Bitis arietans</i>	1

AMPHIBIANS

Family and common name	CAUDATA	Scientific name	Number
Cryptobranchidae:			
Giant salamander		<i>Megalobatrachus japonicus</i>	2
Amphiumidae:			
Congo eel		<i>Amphiuma means</i>	1
Ambystomatidae:			
Spotted salamander		<i>Ambystoma maculatum</i>	1
Salamandridae:			
Japanese red-bellied newt		<i>Dicmictylus pyrrhogaster</i>	8
Red-spotted newt		<i>Dicmictylus viridescens</i>	14
Broken-striped newt		<i>Dicmictylus viridescens dorsalis</i>	7

SALIENTIA

Bufonidae:			
American toad		<i>Bufo terrestris americanus</i>	1
Fowler's toad		<i>Bufo woodhousei fowleri</i>	3
Blomberg's toad		<i>Bufo blombergi</i>	2
Giant toad		<i>Bufo marinus</i>	6
Cuban toad		<i>Bufo peltocephalus</i>	6
Central American toad		<i>Bufo typhonius</i>	2
Pelobatidae:			
European spadefoot toad		<i>Pelobates fuscus</i>	3
Pipidae:			
Surinam toad		<i>Pipa pipa</i>	12
African clawed frog		<i>Xenopus laevis</i>	3
Leptodactylidae:			
Colombian horned frog		<i>Ceratophrys calcarata</i>	2
Hylidae:			
Raddi's frog		<i>Hyla raddiana</i>	1
Barking tree frog		<i>Hyla gratioiosa</i>	1
European tree frog		<i>Hyla arborea</i>	1
Gray tree frog		<i>Hyla versicolor</i>	2
Microhylidae:			
Narrow-mouthed toad		<i>Microhyla carolinensis</i>	2
Ranidae:			
River frog		<i>Rana heckscheri</i>	1
African bull frog		<i>Rana adspersa</i>	1
American bull frog		<i>Rana catesbeiana</i>	1
Green frog		<i>Rana clamitans</i>	1
Leopard frog		<i>Rana pipiens</i>	25

FISHES

NEOCERATODONTOIDEI

Protopteridae:			
African lungfish		<i>Protopterus annectens</i>	2
Snake-headed fish		<i>Polypterus palmas</i>	1

OSTARIOPHYSOIDEI			
Family and common name	Scientific name		Number
Characidae:			
Piranha	<i>Serrasalmus niger</i>		1
Metynnis	<i>Metynnis maculatus</i>		1
Black tetra	<i>Gymnocorymbus ternetzi</i>		1
Cyprinidae:			
Zebra danio	<i>Brachydanio rerio</i>		4
Tiger barb	<i>Barbus partipentazona</i>		1
White cloud mountain fish	<i>Tanichthys albonubes</i>		1
Electrophoridae:			
Electric eel	<i>Electrophorus electricus</i>		8
CYPRINODONTOIDEI			
Poeciliidae:			
Flag-tailed guppy	<i>Lebistes reticulatus</i>		10
Guppy	<i>Lebistes reticulatus</i>		15
Black mollie	<i>Mollienesia latipinna</i>		1
Platy, or moonfish	<i>Xiphophorus maculatus</i>		5
PERCOMORPHOIDEI			
Anabantidae:			
Climbing perch	<i>Anabas testudineus</i>		3
Kissing gourami	<i>Helistoma temminckii</i>		1
Centrarchidae:			
Common bluegill	<i>Lepomis macrochirus</i>		1
Cichlidae:			
Peacock cichlid	<i>Astronotus ocellatus</i>		1
Egyptian mouthbreeder	<i>Haplochromis multicolor</i>		1
African mouthbreeder	<i>Pelmatochromis belladorsalis</i>		1
Angelfish	<i>Pterophyllum eimckeii</i>		1
Jack Dempsey fish	<i>Cichlasoma biocellatum</i>		3
Gobiidae:			
Bumblebee fish	<i>Brachygobius doriae</i>		1
Locariidae:			
South American catfish	<i>Plecostomus plecostomus</i>		2
ARTHROPODS			
DECAPODA			
Cenobitidae:			
Land hermit crab	<i>Coenobita clypeatus</i>		23
ARANEIDA			
Theridiidae:			
Black-widow spider	<i>Latrodectus mactans</i>		1
Aviculariidae:			
Tarantula	<i>Eurypelma</i> sp.		3
ORTHOPTERA			
Blattidae:			
Tropical giant cockroach	<i>Blaberus giganteus</i>		50
MOLLUSKS			
PULMONATA			
Planorbidae:			
Pond snail	<i>Helisoma trivolvis</i>		30

REPORT OF THE VETERINARIAN

The National Zoological Park was without a veterinarian from July 1, 1962, until May 6, 1963, when Dr. Clinton Gray was appointed. During the interim, the director and the general curator, assisted by Thomas Schneider as medical technologist, shared the responsibility for the health of the animals. They were fortunate in having the cooperation and assistance of men in various fields of clinical investigation and medicine. Among these were: Dr. Leonard Marcus and staff, of the Armed Forces Institute of Pathology; Dr. Clarence Hartman and staff, of George Washington University; Dr. M. B. Chitwood, Dr. A. McIntosh, and Dr. W. W. Becklund of the Beltsville Parasitological Laboratory, Department of Agriculture; Dr. A. G. Karlson, Mayo Clinic, Rochester, Minn.; Dr. F. R. Lucas, director of the Livestock Sanitary Laboratory, Centreville, Md.; and Dr. Anthony Morris of the National Institutes of Health, Bethesda, Md.

In October, Tomoka, the baby gorilla, became ill with an intestinal infection. Local pediatricians were called into consultation, but when the animal did not respond to treatment he was taken to Children's Hospital and put in an animal research laboratory under the care of Dr. Everett Lovrein, resident physician, and Dr. Robert E. Martin. Headkeeper Ralph Norris and senior keeper Bernard Gallagher stayed with the little ape 24 hours a day, and he made a speedy recovery. Despite a serious prognosis—Shigellosis complicated by dehydration and acidosis—Tomoka made a remarkable return to his normal weight gain after this hospitalization.

Nikumba, the adult male gorilla, showed signs of having a cold about the middle of June. Medication was given, and he appeared to be recovering, when he was stricken with bilateral paralysis. As of June 30, prognosis is impossible, but he is being treated by an orthopedic surgeon, Dr. Henry Feffer, and a neurosurgeon, Dr. Hugo V. Rizzoli, in consultation with Dr. Alf Nachemson, orthopedic surgeon of the University of Gothenburg, Sweden.

Specialists from George Washington University Medical School tried to establish a suspected pregnancy in Ambika, one of the Indian elephants, by means of electrocardiographic equipment. Electrocardiographs had been taken in the Portland (Oreg.) Zoo when their elephants were pregnant. In the case of Ambika, however, no fetal heartbeat could be detected, and she has now gone past the time for giving birth since the last possible conception date.

The bharal or blue sheep (*Pseudois nayaur*) was inadvertently omitted from the inventory printed in last year's annual report. On July 5, 1962, the last of the line, a female, died, and the post mortem showed liver abscesses. The original pair of these beautiful animals was brought to the Zoo in October 1937 by the National Geographic

Society-Smithsonian Institution Expedition to Netherlands East Indies, having been secured from an animal dealer in Shanghai. Seven young were born in the National Zoological Park between 1939 and 1945.

Following are the statistics for the mortality rates at the National Zoological Park for the past fiscal year and a table of comparison with the past 7 fiscal years:

Mortality, fiscal year 1963				Total mortality, past 7 years
Cause	Reptiles	Birds	Mammals	
No autopsy for sundry reasons ¹	149	35	10	1957....549
Attrition (within 7-14 days after arrival).....		21	5	1958....550
Internal diseases.....	67	37	29	1959....472
Infectious diseases.....		5	4	1960....532
Parasites.....	27	2	1	1961....517
Injuries, accidents.....	5	96	21	1962....584
Euthanasia.....		2	6
Miscellaneous (stillborn, old age, shock).....	8	3	7
Undetermined.....	21	46	29
Total.....	277	247	112	1963....636

¹ Reasons include preserving intact specimen for museum and research, progressed decomposition, insufficient remains in case of predators, etc.

VISITORS

Advanced planning for a National Zoological Park attendance survey began in August 1961 under the direction of Albert Mindlin, statistician of the Management Office, District of Columbia. The actual collection of data commenced on July 1, 1962, and was tabulated for the following 12 months.

The primary purposes of the survey are to obtain objective estimates of the total number of visitors during the fiscal year, the average number of visitors in the Park at any specific period during the year, and the average length of time a visitor's automobile remains within the Zoo.

The procedure involved hand-punching IBM porto-punchcards by specially trained and recruited employees on a statistically predetermined basis at all entrances and exits of the Zoo. Sample interviews of pedestrians and cars leaving at any gate were used as visitor determining factors.

The hand-punched-card data thus generated were mechanically converted into computer-adapted punchcards and fed into an especially

programmed IBM 1401 B computer of the Science Information Exchange of the Smithsonian Institution.

Although the entire project had not been completed at the end of the year, projection of the data of the first 7 months forecasts a visitor population in excess of 3,200,000 from July 1, 1962, to June 30, 1963.

Number of bus groups visiting the Zoo in fiscal year 1963

Locality	Number of groups	Number in groups	Locality	Number of groups	Number in groups
Alabama.....	41	1, 284	Missouri.....	3	113
Arkansas.....	5	175	Nebraska.....	3	118
Colorado.....	3	90	New Hampshire...	7	257
Connecticut.....	26	785	New Jersey.....	84	2, 851
Delaware.....	78	2, 197	New Mexico.....	11	279
District of Colum- bia.....	409	15, 185	New York.....	318	9, 539
Florida.....	105	3, 568	North Carolina...	223	10, 047
Georgia.....	121	4, 025	Ohio.....	26	847
Illinois.....	15	501	Oklahoma.....	2	55
Indiana.....	4	186	Pennsylvania.....	552	19, 689
Iowa.....	3	130	Rhode Island.....	17	600
Kansas.....	3	94	South Carolina...	60	2, 195
Kentucky.....	23	765	South Dakota.....	1	38
Louisiana.....	2	70	Tennessee.....	148	4, 752
Massachusetts.....	11	438	Texas.....	22	124
Maine.....	8	334	Virginia.....	1, 734	55, 429
Maryland.....	2, 260	64, 283	West Virginia.....	153	4, 693
Michigan.....	8	424	Wisconsin.....	2	115
Minnesota.....	1	41	Total.....	6, 496	206, 444
Mississippi.....	4	128			

About 2 p.m. each day the cars then parked in the Zoo are counted and listed according to the State or country from which they come. This is, of course, not a census of the cars coming to the Zoo but is valuable in showing the percentage of attendance by States of people in private automobiles. Many District of Columbia, Maryland, and Virginia cars come to the Zoo to bring guests from other States. The tabulation for fiscal year 1963 is as follows:

	Percentage		Percentage
Maryland.....	31.4	Massachusetts.....	0.8
Virginia.....	21.5	South Carolina.....	.7
District of Columbia.....	19.3	Illinois.....	.6
Pennsylvania.....	4.4	Connecticut.....	.6
New York.....	2.5	California.....	.6
North Carolina.....	1.9	Tennessee.....	.5
Ohio.....	1.4	Michigan.....	.5
New Jersey.....	1.4	Georgia.....	.5
West Virginia.....	1.3	Texas.....	.5
Florida.....	1.0	Indiana.....	.4

The remaining 8.2 percent came from other States, Canada, Canal Zone, France, Germany, Italy, Japan, Mexico, Newfoundland, Peru, Puerto Rico, and Saipan.

On the days of even small attendance there are cars parked in the Zoo from at least 15 States, the District of Columbia, and foreign countries. On average days there are cars from approximately 22 States, the District of Columbia, and foreign countries; and during the periods of greatest attendance the cars represent no less than 34 different States and countries.

PERSONNEL

Dr. Clinton W. Gray was appointed veterinarian on May 6, 1963. Prior to his appointment at the Zoo, Dr. Gray was employed as veterinarian by the Agency for International Development and spent considerable time overseas.

Henry P. (Harry) Leech, who for more than 20 years had been associated with his father, L. Gordon Leech, in the management of the Zoo restaurant, died on June 26 at the age of 41. He was well known to Zoo visitors, and particularly to the "Anteaters" who meet in the fall to eat wild game at the restaurant. He will be greatly missed by his many friends.

During the year eight employees retired. Pvt. Robert Ewell, appointed March 6, 1912, retired December 31, 1962. Most of his 50 years of service had been with the police force on night duty. Roy Jennier, appointed October 18, 1929, was for many years in charge of the reptile house. He was a member of the National Geographic-Smithsonian Expedition to the East Indies in 1937. At the time of his retirement, December 31, 1962, he was supervisory animal keeper in the monkey house. James Derrow, who also retired on December 31, was maintenance general foreman and responsible for all construction and repairs in the Zoo. He had been with the Park more than 30 years since his appointment on July 6, 1931. Michael Dubik, head supervisory gardener since July 31, 1956, retired May 24, 1963, because of ill health; Frank Mele, mason leader appointed July 24, 1947, retired August 18, 1962; Mirza Wilson, chief operating engineer appointed June 19, 1950, retired April 27, 1963; Lizzie McDaniel, custodial laborer since May 1, 1953, retired February 8, 1963; and Dave Rose, laborer, appointed March 2, 1949, retired April 30, 1963.

The director attended the annual meeting of the American Association of Zoological Parks and Aquariums in Kansas City, Mo., in September and was voted president-elect for 1962-63. He also attended the meeting of the International Union of Directors of Zoological Gardens in San Diego, Calif., later that same month. On

November 20 he attended the formal opening of the new zoo in Phoenix, Ariz. On March 1, he traveled to Fort Worth, Tex., for the board meeting of the American Association of Zoological Parks and Aquariums. On March 31, accompanied by Richard Dimon, project architect for the new construction at the National Zoological Park, he left for a short study tour of European zoos.

J. Lear Grimmer, associate director, attended the meeting of the American Association of Zoological Parks and Aquariums in Kansas City, and Travis E. Fauntleroy, assistant to the director, attended the midwinter conference of the same association at Fort Worth.

In 1963 there were 210 authorized positions, an increase of 5 positions over 1962: office of the director, 11; operations and maintenance department, which includes the mechanical division, police division, grounds division, and services division, 122, an increase of 4 (1 mechanic, 1 hydraulic equipment operator, 1 tree maintenance worker, and 1 laborer); animal department, 76, an increase of 1 (night keeper); and the scientific research department, 1.

ANIMAL DEPARTMENT

In preparation for reconstruction work planned for the National Zoological Park, several existing areas were made suitable to house evacuated animals. The entire stock of the birdhouse was moved to various outdoor enclosures and to the old antelope house, which had been closed to the public for several years. Converting the antelope house into a temporary birdhouse required the construction of one large flight cage and the rewiring of some of the old antelope stalls.

A number of animals that were heretofore housed singly were carefully introduced to one another, and by keeping several together in one cage, additional space was made available.

To utilize space further, the animal department continued the program begun last year of wintering tropical animals outdoors. A "flight cage" which had originally been built for indoor use by gibbons was rebuilt on the northeast side of the lion house. It was equipped with cinderblock and concrete shelters with one heat lamp and soil-cable floor heat in each shelter. A group of four young animals and a fully adult breeding pair were moved into this outdoor enclosure in August in order to give them sufficient time to become accustomed to the gradual drop of temperatures in autumn. The female of the adult pair gave birth to a baby in December, which she carefully nursed, bringing it outdoors for at least 2 hours a day except during bad weather.

Theoretically much less suited to withstand severe winter temperatures outdoors was a pair of South American tapirs, transferred to the so-called beaver pond late in summer. A shelter with tinfoil

insulation between two layers of boards was constructed, but no artificial heat was installed. With the onset of cold weather, deep straw bedding was provided. Both tapirs were put on a diet of approximately eight fish a day in addition to their normal ration of fresh vegetables and A-1 ration. Despite the fact that the pond froze over completely for the better part of 4 months, both animals survived without any damage to the skin or feet. Neither animal appeared to object to the snow on the ground, and their customary summertime motion pattern was clearly indicated by footprints in the snow.

Patagonian cavies, another unusual species, were also successfully wintered. Although these animals were provided with a noninsulated but well-built shelter, they preferred to make their own excavations in frozen ground and seek shelter below the house provided. Six young have been born in this enclosure since February.

A number of tropical birds, primarily psittacines, wintered outdoors, provided only with minimal heated-perch shelters with infrared lamps.

Two female lion cubs born at the Zoo in March 1962 spent most of the winter in a large, exposed, open-air cage with no protection other than a continuously open indoor shelter which was rarely, if ever, used during the daytime.

The total number of accessions for the year was 986. This includes gifts, purchases, exchanges, deposits, births, and hatchings.

POLICE DIVISION

The most important activity of the police division was the creation of a law enforcement school. Appointed as training officer, Lt. D. B. Bell formulated plans for a comprehensive training program. Its value was readily recognized and received official approval for its implementation from the Secretary of the Smithsonian Institution. The course encompassed ten 8-hour days of sessions, at the conclusion of which an examination was given to participants. It was a highly successful venture, and it is now a basic requirement of the National Zoological Park police that all new officers must take and pass the course.

Three members of the division, Lieutenant Wolfe, Sergeant Grubbs, and Private Porter, were qualified as pistol instructors for the police force by special agent William Little, of the Security Branch, State Department, in September 1962. Fourteen visitors sent in written commendations on the courtesy, kindness, and consideration extended to the general public by the police. Through the efforts of Lt. J. R. Wolfe, 24 certificates were awarded by the American Red

Cross to employees of the National Zoological Park who have donated a gallon or more of blood to the blood-donor program.

Six walkie-talkie sets were acquired to facilitate direct communication between headquarters and the officers on outside duty in the Park. Two sets have been assigned to the animal department and have proved very useful.

The police, under the supervision of Private Adams, assisted Albert Mindlin of the Management Office of the District of Columbia in making the visitors' survey, as noted elsewhere in this report.

In January 1963 the Federal Bureau of Investigation requested from the division a monthly report on the number of arrests and complaints, to be used by the FBI in its compilation of data on the total crimes committed in the United States.

A total of 92 truant children were picked up in the Park, and appropriate action was taken by the division. The police found 311 lost children and returned them to their parents or chaperones. Eighteen pairs of eyeglasses and sunglasses, found and unclaimed, were sent to the Society for the Prevention of Blindness, and nine bags of clothing and miscellaneous articles, found and unclaimed, were turned over to Goodwill Industries. During the year 9,776 visitors stopped at the police station requesting various types of information. The first-aid station, at police headquarters, treated 69 severe cases and 705 minor cases.

The American Red Cross Blood Bank received 67 pints of blood from Zoo employees during the year. Total donations are now well over 700 pints.

MAINTENANCE, CONSTRUCTION, AND GROUNDS

The mechanical division has the responsibility for the maintenance and repair of the buildings and facilities of the National Zoological Park. This responsibility is met by the heating and ventilating section, and by the building section which, in addition to continuing maintenance, constructed numerous new shelters, paddocks, and cages for the animals exhibited.

The renovations of the puma house and the main bear line were completed. The interior dens at the puma house are now completely rebuilt. Five partition walls at the bear line were rebuilt, using the gunnite or sprayed concrete which proved so satisfactory during the previous year.

A new exhibit for gibbons was constructed in the area adjacent to the lion house. The cage, 12 by 40 feet, provides two separate enclosures, each large enough to allow space for the gymnastics of these animal aerialists.

Results of the maintenance program are most apparent in the reptile building. The new paint in the visitor area and the rebuilding and decorating of the cages, along with the contract work done as a safety measure, have resulted in an orderly, well-kept building. Among the improvements not readily apparent are the new electric panels which provide uninterrupted service for the electric lighting as well as power for the refrigeration and other commissary activities in the reptile-house basement.

The sign program, now well underway, required the coordination of the carpenter shop, paintshop, and metal shop to frame, paint, and erect the attractive and informative signs on the various exhibits throughout the Zoo.

The remodeling of the birdhouse and the construction of the new east-west access road put an additional burden on the mechanical division, as temporary shelters and enclosures had to be improvised for the birds and animals dislocated by the new construction. A flight cage was built in the old antelope house to provide a temporary home for birds evacuated from the birdhouse. A shelter and enclosure were provided for the dorcas gazelles, relocated because of the new road. In addition, a new yard with heavy fencing was prepared for the Cape buffalo.

The deep excavation required to maintain a suitable gradient for the new perimeter road unearthed a myriad of sewers and waterlines which had to be traced and relocated, thus adding to the already heavy workload of the plumbing crew.

Many of the improvements made during the year were in the interests of safety. In cooperation with the District of Columbia Department of Buildings and Grounds, practically all the glass cage fronts at the reptile house were replaced, as were also several large panes of glass separating the visitors from the animals in the small-mammal house.

The eagle cage, which is to remain in the remodeled birdhouse area, was painted under a contract with a local rigging company.

The walkway from the fox line through the hollow up to the owl and silver-gull cages was resurfaced, and road repairs were made.

The grounds department moved many plants from the birdhouse area to the center of the Zoo, sodded several areas where there previously had been no grass, and enhanced the appearance of the Park by the addition of flower beds around the buildings. A number of plants and shrubs were purchased, and donations of flowers and plants were received from the District of Columbia Waterworks, the Botanical Garden, Navy Hospital, Naval Ordnance, and the management of the annual flower show.

The building occupied by the grounds department was renovated to clear walkways and to store tools and equipment so as to eliminate trip hazards. Steel helmets, new ropes, and climbing equipment were placed in service, and an additional treeman was hired. Low limbs over bridle paths were cut, and dead limbs removed from 140 trees over walks and along the main road. Forty trees in bad condition were cut and removed. Large holes in lawns were filled in.

INFORMATION AND EDUCATION

After the planning, equipping, and staffing of a sign laboratory in the basement of the elephant house, which was completed October 12, 1962, the department's activities for the year were mainly concerned with the writing, designing, producing, and mounting of new modern animal identification labels for the Zoo. Durable outdoor labels are printed photographically on sensitized anodized aluminum. Other techniques of exhibits production successfully employed are silk-screen prints and film transparencies for indoor labeling.

To date, five units of the Zoo have been completely relabeled—the puma house, main bear line, short bear line, ring cages, and the elephant house. The reptile house is being labeled. A total of 397 animal identification labels and other supporting Zoo signs (such as large maps of the Zoo, explanation of the new construction, building and safety signs) were produced and mounted in the period from October 12, 1962, to June 30, 1963.

Additional department activities during the year included artwork, charts, graphs, mapwork, a number of special projects, dissemination of animal information by telephone and correspondence, library maintenance, and 18 special guided tours for groups of handicapped children, visiting schools, and foreign guests.

On July 10, 1962, a group of 2,300 foreign exchange students visited the Zoo; on May 12, 1963, 9,248 School Safety Patrol children, transported in 266 buses, came to the Zoo following their annual parade on Constitution Avenue. A group of the animal keepers, on their day off, entertained the underprivileged children from D.C. Junior Village, taking them on a tour of the Zoo and giving them lunch in the cafeteria. On May 24, 250 "Friends of the National Zoo" were given a guided night tour of the Park.

The director gave two radio talks and three talks to local organizations. He appeared on television, once in Sarasota, Fla., in connection with the proposed establishment of a zoo, and once on WTOP (Washington) with Dr. W. T. Roth, general curator. The associate director, J. Lear Grimmer, addressed the University Club, Wilmington, Del., in connection with the development of a zoo in that city.

The September 1962 issue of *Parks and Recreation* carried an article by Charles Thomas, senior keeper, on wintering tropical birds and animals outdoors. J. Lear Grimmer's account of his work with the hoatzin in British Guiana appeared in the September issue of *National Geographic Magazine*.

SAFETY SUBCOMMITTEE

The National Zoological Park safety subcommittee, consisting of Lt. John R. Wolfe, chairman; Capt. C. E. Brink, police division; F. M. Dellar, administration office; Bert J. Barker, animal department; Reily Straw, maintenance and construction; D. E. Schwartzbeck, grounds department; and Mrs. W. M. Holden, secretary, held monthly meetings to suggest, discuss, and make recommendations to the director on safety improvements.

A self-survival course, given by the American Medical Association and sponsored by the American Red Cross, was attended by Sergeants Canter and Grubbs. Sergeants Canter and Kadlubowski attended a traffic workshop, sponsored by the National Safety Council. Shotguns were installed in locked gun cabinets with glass fronts, located in principal buildings, and seven keepers were given instructions in the proper handling of these guns in case of emergency.

Steps of some buildings were painted with black and yellow stripes as a caution to the public. All buildings have been checked for fire hazards and have exit lights installed at main exits.

Members of the subcommittee periodically inspect all buildings, grounds, and equipment in the Park and remove or correct all minor hazards affecting visitor or employee safety.

COOPERATION

At all times special efforts are made to maintain friendly contacts with other Federal and State agencies, private concerns and individuals, and scientific workers for mutual assistance. As a result, the Zoo receives much help and advice and many valuable animals, and in turn it furnishes information and, whenever possible, animals it does not need.

Through the cooperation of the U.S. Fish and Wildlife Service, and Charles A. Milton, chief game warden, Maryland Game and Inland Fish Commission, a number of waterfowl were obtained for the Zoo. Division headkeeper W. Widman and keepers Bruce Williams and Robert Williams were permitted to trap a number of wild ducks and geese on Chesapeake Bay.

Special acknowledgment is due William Taback and John Pulaski, in the office of the Dispatch Agent in New York City, and Stephen E. Lato, Dispatch Agent in San Francisco, who are frequently called

upon to clear shipments of animals coming from abroad, often at great personal inconvenience—late at night, or on a weekend.

When it is necessary to quarantine animals coming into this country, they are taken to the U.S. Department of Agriculture's station in Clifton, N.J. During the past year, Dr. H. A. Waters and Andy Goodel, two of the officials stationed there, have been most cooperative in keeping the National Zoological Park informed as to the well-being of animals and birds being held there for quarantine.

Animals that die in the Zoo are offered to the U.S. National Museum. If the Museum does not need them, either as study specimens or as exhibits, they are sent on request to research workers in other institutions. Specialists at the Museum are always willing to be of help in identifying rare specimens that are acquired by the Zoo.

The National Zoological Park cooperated with the National Capital Parks and lent small animals to Park naturalists and to the Nature Center in Rock Creek Park for demonstrations.

FINANCES

Funds for the operation of the National Zoological Park are appropriated annually under the District of Columbia Appropriation Act. The operation and maintenance appropriation for the fiscal year 1963 totaled \$1,470,200, which was \$119,400 more than for the previous year. The increase consisted of \$48,300 to cover salary increases for wage-board employees; \$23,700 for within-grade salary advancements for both general-schedule and wage-board employees; \$18,000 to cover costs of reallocations; \$17,820 to establish five new positions for 75 percent of the year; \$7,080 for the purchase of supplies and materials; and \$4,500 for the purchase of new equipment.

Of the total appropriation, 84.7 percent (\$1,245,809) was used for salaries and related personnel costs, and 15.3 percent (\$224,391) for the maintenance and operation of the Zoo. Included in the latter figure were \$74,000 for animal food; \$19,000 for fuel for heating; \$26,680 for materials for building construction and repairs; \$12,826 for electricity; \$13,725 for the purchase of animals; \$6,255 for telephone, postal, and telegraph services; and \$7,460 for veterinarian equipment and supplies. The balance of \$64,445 in operational funds was expended for other items, including freight, sundry supplies, uniforms, gasoline, road repairs, equipment replacement, and new equipment.

CAPITAL IMPROVEMENTS

Money appropriated this year for new construction totaled \$1,227,000.

During the first part of the fiscal year the preparation of detailed plans for the first phase of the capital improvement program was con-

tinued. These plans were submitted in final form in November. Two separate bids were advertised and awarded.

The Edrow Engineering Co. was awarded the contract for the renovation and modernization of the birdhouse and the construction of a new walk-through flight cage. Work started on April 29, 1963. As noted elsewhere, the birds had been evacuated prior to this date. It is anticipated that the work will be completed in April 1964.

The Cherry Hill Sand & Gravel Co. was awarded the contract for the relocation of the east-west access road. Work started on March 27, 1963. The excavation and grading are now well underway, and it is anticipated that the road will be ready for use in early fall.

National Capital Parks, Department of the Interior, is relocating Beech Drive, as mentioned in last year's report. This is being done for the National Park Service by the Bureau of Public Roads. After tunneling through more than 780 feet of solid rock under "Administration Hill," the top half of the tunnel was completed May 24, 1963.

Plans for the second phase of the capital improvement program, which will consist of enclosures for the hardy hoofed stock on the present site of the buffalo and zebra pens, a new entrance on Connecticut Avenue, and deer paddocks on the hill behind the birdhouse, are being drawn up by the architectural firm of Daniel, Mann, Johnson & Mendenhall. Plans are also being made for the redevelopment of the office area.

All redevelopment work is being done under the direction of the District of Columbia Department of Buildings and Grounds. Special acknowledgment is due the director of that department and his able staff.

Respectfully submitted.

THEODORE H. REED, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the Astrophysical Observatory

SIR: I have the honor to submit the following report on the operations of the Smithsonian Astrophysical Observatory for the fiscal year ended June 30, 1963:

The Astrophysical Observatory includes two divisions: the division of astrophysical research in Cambridge, Mass., for the study of solar and other types of energy impinging on the earth; and the division of radiation and organisms in Washington, for the investigation of radiation as it relates directly or indirectly to biological problems. Shops are maintained in Washington for work in metals, woods, and optical electronics, and to prepare special equipment for both divisions; and a shop conducted in cooperation with the Harvard College Observatory in Cambridge provides high-precision mechanical work. Twelve satellite-tracking stations are in operation, in Florida, Hawaii, and New Mexico in the United States and abroad in Argentina, Australia, Curaçao, India, Iran, Japan, Peru, South Africa, and Spain.

DIVISION OF ASTROPHYSICAL RESEARCH

Research at the Smithsonian Astrophysical Observatory continues to yield new knowledge and increased understanding of a broad range of astrophysical phenomena.*

Concerning members of the solar system—planets, satellites, meteoroids, comets, etc.—the scientific staff have pursued many investigations. The effects of solar phenomena on these other members of the system received particular attention, befitting the rapidly increasing scientific interest in these topics and the increasing national interest in space.

The sun itself deserves ever more intensive observation and analysis. Observatory scientists have applied their talents to these studies. Instruments carried on Orbiting Solar Observatories have become a major source of solar data.

Beyond the solar system, the stars, galaxies, nebulae, and interstellar matter present numerous research problems, many of which members of the Observatory staff have studied. Instrumentation now

* Unless otherwise noted, research is supported from Federal funds appropriated to the Smithsonian Institution. The Observatory, by support of the scientists, shares in the support of all research. Support from outside sources is noted numerically where appropriate and detailed in footnotes 1-20 on p. 164.

being prepared for the Orbiting Astronomical Observatories is expected to yield new data not obtainable from ground observatories. The use of electronic computers of great capacity and capability has allowed consideration of detailed aspects of stellar theories.

A strong feature of the broad scope of the Observatory's scientific program is the ease with which a scientist investigating some particular topic may draw on information and techniques generated by others pursuing different topics. Particularly gratifying were several cases in which instrumentation developed for a specific project was adapted to a quite different application. The many instances of cross-fertilization of scientific disciplines occurring within the Observatory's activities make subdivision of its program difficult. This, however, is a small price to pay for the program's increased scientific value.

Planetary sciences.—With the advent of intensive national and international space programs, interest in the planets has increased remarkably in both scientific and lay circles. Scientists, including those at the Observatory, have been attracted by the research opportunities offered by scientific spacecraft.

Studies of the earth were the first to benefit from artificial satellites as a research tool. Scientists at SAO have been leaders in the utilization of satellite data for many such investigations.

Three major areas of investigation are based on the precise satellite-tracking data obtained by the network of Baker-Nunn cameras.¹ The first is the determination of the density of the earth's atmosphere as a function of position and time. These dependencies, in turn, are used in detailed analyses of atmospheric phenomena and their correlations with other geophysical and solar phenomena. The second important area of investigation is directed initially toward the detailed specification of the earth's gravitational potential. This specification of the geopotential is of basic importance in studies of the interior of the earth. The third area is the determination of accurate geometrical positions of the Baker-Nunn stations relative to one another. Knowledge of these positions contributes strongly to an improved geometrical figure of the earth.

Although these three areas of investigation have quite different scientific objectives, they are nevertheless intimately related. Each depends on identification and isolation of factors that influence the accuracy with which a theoretical orbit may be made to fit the observational data. Basically, the analytical process consists of finding the values of such parameters as atmospheric density, geopotential coefficients, and station coordinates, which optimize the agreement between theoretical and observed satellite positions. The effects of these factors are interrelated in such a way that scientific progress

¹ See footnotes on p. 164.

in each of the three areas is best advanced by an iterative process in which refinements of the parameters are accomplished simultaneously or cyclically for a number of satellites. This diverse program is under the broad guidance of Dr. Fred L. Whipple, director of the Observatory.

From 5 years of investigation since the first artificial satellite, we now know much about the high atmosphere. The past year saw Dr. Luigi G. Jacchia's timely preparation of a survey, "Variations in the Earth's Upper Atmosphere as Revealed by Satellite Drag," for the *Reviews of Modern Physics*.¹ The comprehensive content of this review stands witness to the sensitivity and refinement of the techniques developed and employed at SAO.

Analyses by Dr. Jacchia and Jack W. Slowey have established that—

(1) Both electromagnetic (extreme ultraviolet) and corpuscular radiation from the sun contribute to the heating of the upper atmosphere.

(2) Most of the energy carried by these two forms of radiation is absorbed at heights lower than 200 km; the atmosphere above this level is heated by conduction from below.

(3) The greater heating in the sunlit hemisphere gives rise to a permanent atmospheric "bulge," at the center of which the temperature is 40 percent higher than it is at the opposite point in the dark hemisphere. Because of the earth's rotation, this bulge travels around the globe at a latitude equal to that of the subsolar point; its longitude is the one for which the local time is 2 p.m.

(4) The temperature of the upper atmosphere can be correlated with the decimetric (radio) solar flux, which exhibits variations with characteristic cycles of 27 days (caused by the rotation of the sun) and of 11 years (caused by the sunspot cycle). The temperature can be computed and instantaneous density profiles derived from atmospheric models when the decimetric solar flux is known.

(5) The atmosphere of the earth is heated and expanded during magnetic storms by a factor directly related to the geomagnetic planetary index a_p .

(6) The semiannual effect in upper atmospheric densities is real. This shows that the solar wind contributes substantially to atmospheric heating, even during quiet periods.

During the past year larger quantities of precisely reduced tracking data, particularly for satellites of quite different inclinations, have become available from the Baker-Nunn system. Imre Izsak, Dr. Yoshihide Kozai, and their associates have used these enlarged data in new determinations of the coefficients in an expansion of the gravitational field of the earth in spherical harmonics.²

Mr. Izsak has given particular attention to determination of coefficients of higher-order tesseral and sectorial harmonics. The perturbation theory of these effects being well developed, the problem actually consists of the construction of extensive computer programs that would analyze the large number of observations available. Sev-

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eral solutions have been obtained for the representation of the field of gravity. These solutions are in reasonable agreement with results obtained from the analysis of surface gravity data.

Other analyses of the geopotential are continuing. In Japan Dr. Kozai is at present seeking to establish whether the coefficients in the expansion of the earth's potential have seasonal variations.

Using the representation of the geoid derived by Izsak, Kozai, and their colleagues, Chi-Yuen Wang has found a strong correlation between the distribution of heat flow and the undulations of the geoid.¹ It is reasonable to say at this time that the ups and downs of the geoid may indicate cold and hot regions under the crust.

Two approaches to the determination of more accurate station coordinates are being pursued at the Observatory. One of these recognizes that the deviations between values observed from a station and values predicted from theoretical calculations depend on errors in the presumed station coordinates. Those coordinates that produce minimum deviations are adopted as improved coordinates. Mr. Izsak and Dr. George Veis are now effecting this procedure simultaneously with improvements in the geopotential coefficients.¹

The second approach is purely geometrical. If two stations simultaneously observe a satellite, it is possible to calculate the direction cosines of the line joining the stations. During the past year a determined effort by the Baker-Nunn stations produced a number of simultaneous observations. Some of these were photographs of the light flashes from the ANNA geodetic satellite. Although we do not yet have so many simultaneous observations as we would desire, analysis by Dr. Veis, Jan Rolf, and Antanas Girnius have given reasonable values in satisfactory agreement with those of the other approach.

For computation of datum shifts of large (continental) geodetic systems,¹ Dr. Walter Köhlein has developed special ellipsoidal transformations. These transformations are required to adjust the large system so that their relative configurations are in accord with the determined station locations.

For full exploitation of these geodetic capabilities, a more extensive network than the 12 Baker-Nunn stations is desirable. An inexpensive satellite-tracking camera able to photograph many of the brighter satellites has been designed and fabricated under the direction of Dr. Veis and Robert W. Martin. This prototype camera is in experimental operation in Athens, Greece.

Not only the orbit of an artificial satellite but also its motion about its center of mass is affected by its environment. A theory developed by Dr. Giuseppe Colombo has been confirmed with the observation

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of the changing in orientation of the spin axis of several satellites.¹ The variation of the angular velocity of the satellites has been successfully correlated with the variation of the component of the magnetic field normal to the spin axis.

Dr. Richard H. Giese used optical observations (Baker-Nunn and Moonwatch) to develop methods of attitude determination for cylindrical satellites with specular reflection.² For diffuse reflecting cylinders the formula for intensity as a function of arbitrary angles of illumination and observation was derived and applied to numerical computations for a tumbling cylinder.

Phenomena in the earth's high atmosphere are being investigated with several tools. As we have seen above, the atmospheric drag on satellites has provided a sensitive measurement of density variations above about 180 km. This altitude might be lowered if satellites of very high density were launched. Dr. Charles Lundquist is examining the value of launching an ensemble of spherical satellites, some with high densities, as a noninterference experiment on a development flight of a large rocket vehicle.

At altitudes between 80 and 100 km, the Doppler shifts in radar returns from meteor trails may be used to measure the velocity and direction of winds in the lower ionosphere. A project to make such measurements and to study wind relationships² to other ionospheric phenomena has been initiated by Dr. Mario Grossi in conjunction with the Harvard-SAO Radio Meteor Project.³

Laboratory studies of atomic collision processes⁴ are being combined with a study of relevant problems in atmospheric physics in the work of Dr. Nathaniel P. Carleton and his associates, Dr. Charles H. Dugan, C. Papaliolios, and Miss Marion L. Shaw. The greatest effort has been applied to investigation of excitation of metastable states in O₂, N₂, and O by electron impact, and of the subsequent reactions of these metastable states with other gases, including excitation transfer and actual chemical reaction. Dr. Carleton, in collaboration with L. R. Megill of the National Bureau of Standards Boulder Laboratories, has used recent data on electron collisions to study the problem of electron heating by electric fields in the ionosphere. The group is investigating, in particular, which features of the airglow and aurora may be caused by electron-impact excitation by the heated electrons. They conclude that the red lines of atomic oxygen, 6300-6364 Å, are almost certainly excited by this means in low-latitude auroral forms, but that no other emission in the airglow or aurora is so excited.

The atmospheres and surfaces of other planets are being studied. Dr. Carl Sagan has made theoretical studies of the expected limb-

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darkening in planetary atmospheres, both at infrared and at microwave wavelengths, with particular reference to the atmosphere of Venus. Preliminary results predict only a moderate microwave limb-darkening from expected absorbers in the lower Cytherean atmosphere. The model of the Jovian red spot, which assumes it to be a floating object, was examined and shown to be unlikely.

Dr. Sagan was a coexperimenter on the infrared radiometer of the U.S. spacecraft *Mariner II*. The experimental results indicated distinct limb-darkening in the 10-micron region and no clear breaks in the Cytherean cloud layer. Dr. Sagan is also an experimenter for an infrared spectrometer designed for a forthcoming Mars fly-by mission.

Study of the rings of Saturn continues. Dr. Allan F. Cook and Dr. Fred Franklin are undertaking a more accurate scattering theory for the sunlight illuminating the rings and a more accurate solution of the Boltzmann equation for the ring particles.⁵

A theoretical investigation of the formation of absorption bands in a multiple scattering atmosphere was conducted by Dr. William M. Irvine. His investigation of strongly asymmetric multiple scattering is continuing, with emphasis on the variation in limb-darkening as a function of asymmetry factor and optical depth.

The existing theories of motion of the major planets are not satisfactory from the modern point of view, especially not for the requirements of space travel. Their improvement, however, is hardly conceivable without progress in computer technology. Mr. Izsak is therefore considering the possibility of using digital computers for the construction of analytical perturbation theories. As a first step, a very efficient program has been developed for the computation of Laplace coefficients and their derivatives. With cooperation from an MIT team, a program has been written for the construction of symbolic expressions, called the Newcomb operators. At present, a generalization of these results is being investigated, together with their application to the problem of close commensurabilities in celestial mechanics.

The orbits of the minor planets present problems which Dr. Don A. Lautman is considering. An analysis of the distribution of the perihelia of the minor planets has been completed.¹ Dr. Lautman and Dr. Colombo have examined the small-amplitude librations of a particle near the triangular point in the semirestricted three-body problem. They are extending this research to an analysis of orbits of minor planets whose periods are commensurate with that of Jupiter.

The origin of the solar system and the production of isotopes in protoplanets are the areas Dr. Henri Mitler is studying. A comparison of theoretical results with observations may allow a choice

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among several possible alternative primitive compositions for a proto-Earth.

Exobiology.—Ultraviolet irradiations of possible simulated primitive terrestrial environments, which Dr. Sagan performed in cooperation with Dr. C. Ponnampertuma, exobiology division, Ames Research Center, NASA, have produced nucleoside phosphates and other molecules intimately involved in contemporary terrestrial biological processes. Such synthetic reactions had been predicted by Dr. Sagan in 1957.

Dr. Sagan made other studies on methods for detection of extraterrestrial life and on the frequency of possible advanced extraterrestrial life forms. Using Mie theory and a computer program, he is continuing a critical study of the panspermia hypothesis.

In an experimental program performed by Dr. Sagan in cooperation with Dr. Stanley Scher at the University of California Space Sciences Laboratory,⁹ simulated Martian environments have been inoculated with a variety of terrestrial soil types and assayed for the survival of the contained terrestrial microorganisms. The preliminary results indicate that all samples of terrestrial soil tested have a population of microorganisms that can probably survive on Mars. This conclusion emphasizes the necessity for rigorous sterilization of Mars-impacting space vehicles.

Lunar science.—The moon is now the object of intense investigation by many scientists from all parts of the world. This interest is stimulated, of course, by past and forthcoming lunar probes, orbiters, softly landed instrumentation packages, and eventual manned exploration.

The Astrophysical Observatory is pursuing several lunar investigations which are closely related to its other programs and for which, therefore, the Observatory is peculiarly well prepared. One such topic is the determination of the moon's gravitational potential from analyses of the motion of bodies orbiting it. Attempts by the United States to launch lunar orbiters have been unsuccessful to date, but will undoubtedly meet eventual success. Dr. Kozai has completed an approximate analytical study of the motion of an orbiter. He is proceeding with a program for numerically integrating the equations of motion.

Drs. Lautman and Colombo have shown that radiation pressure significantly changes the orbit of a "balloon" spacecraft and could effect a lunar capture of an initially geocentric orbit.

The impacts of meteorites on the moon produce craters of all sizes, depending upon the size and velocity of the incident body. The size distribution of lunar craters has been analyzed by Dr. Gerald S.

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Hawkins. The results of this study can be correlated with meteorite size and velocity distributions from other investigations.

Meteoritic science.—The solar system contains much meteoric matter. The Observatory applies a vast range of techniques and instrumentation in its broad meteoritic research program. Investigations include the nature of meteoritic matter in the solar system, the theory of meteors in the earth's atmosphere, observation of meteors by optical and radar instruments, mineralogical analyses of meteorites, metallurgical analyses of meteorites, and finally observations of artificial bodies simulating meteorites.

During the past year Dr. Whipple has made new calculations of the frequencies of small bodies near the earth and their penetrating powers on thin surfaces in space. The measurements made in a NASA satellite have confirmed the general order of magnitude of the new calculations, which have reduced the meteoritic hazard by some three orders of magnitude since early calculations. In these and other overall studies of meteoric matter in the solar system, Dr. Whipple draws on specific results from the diverse meteoritic investigations in which he cooperates as director of the Observatory.

Dr. Richard B. Southworth has formulated a convenient quantitative description for the steady-state space distribution of particles under the Poynting-Robertson effect. Using this description and results from analyses of Comet Arend-Roland, he is studying generation of the zodiacal cloud by cometary dust.

Robert E. Briggs is now extending previous work on the space distribution of interplanetary particles to include a study of velocity distributions.

Research into the concentration of micrometeorites in the vicinity of the earth continues. The many-pronged effort of Drs. Colombo and Lautman consists of: (a) Evaluation of the amount of dust placed into orbit around the earth as a result of meteors colliding with the moon and ejecting material; (b) gravitational focusing of interplanetary particles by the earth, the direct capture of interplanetary particles moving under the influence of the gravitational fields of the sun and earth, and the Poynting-Robertson effect; and (c) capture of particles by the combined effects of gravity, atmospheric drag, and radiation pressure.

When particles from space plunge into the earth's atmosphere, they generate a trail of luminosity and ionization. Several scientists of the Observatory continue to work on the physical theory of meteors. Theoretical studies are being made by Drs. Cook, Hawkins, Richard E. McCrosky, and Franco Verniani. Most of these studies are closely linked with analyses of observational data.^{1, 5, 7}

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Dr. Carleton and his associates are conducting laboratory experiments on ion-molecule and molecule-molecule collisions in the range of 200-2,000 ev energy.⁴ One application of this work is a calculation of the amount of excitation and ionization produced by micrometeorites too small to be observed individually on their entry into the atmosphere. In that connection they have considered what limits can be set on the rate of influx of such micrometeorites, concluding that such effects are negligible.

Statistical analyses of precisely reduced photographic meteor data from Super-Schmidt cameras are being made by Dr. Jacchia, Dr. Verniani, and Mr. Briggs. Their aim is to publish the wealth of information, obtained through several years of meteor photography and painstaking reductions, concerning the interaction between the meteor body and the atmosphere. In particular, they can determine the mass, luminous efficiency, and tensile strength of a meteor body more accurately than has been possible before.

In study of the spectra of meteors,⁵ Dr. Cook is working with Dr. I. Halliday of the Dominion Observatory, Ottawa, and Dr. P. M. Millman of the National Research Council of Canada. Currently a quantitative spectral analysis of Perseid spectra is under way.

Work on daily motion of the radiant of the Quadrantid meteor stream was begun. Dr. Frances Wright will continue this project until all photographic film on hand has been measured, and the motion of the radiant is determined. This study will yield further knowledge of the nature of the Quadrantid meteor streams.

Dr. McCrosky has continued a cooperative research effort with Harvard College Observatory, U.S. Air Force,⁶ MIT Lincoln Laboratory,⁷ and NASA, in which various successful attempts have been made to inject into the upper atmosphere, at meteoric velocities, bodies of sufficient and known size to reproduce the meteor phenomena.

This research has led to improved values of the luminous efficiency of ablating hypervelocity bodies entering the atmosphere and of the masses and densities of meteoroids.

The Radio Meteor Project⁸ is a joint enterprise of the Smithsonian Astrophysical Observatory and Harvard University. The project has operated a multistation radar system at Havana, Ill., at a peak transmitter power of 4 megawatts. Meteors have been detected down to a limiting magnitude of +12 on the visual scale. Dr. Hawkins is the scientist in charge of this project.

To determine the atmospheric trajectory of the meteoroid and its orbit in interplanetary space, Dr. Hawkins and Dr. Southworth have analyzed the radar echoes. Drs. Hawkins and Bertil-Anders Lindblad have found that there is a definite difference in the populations of large

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and small meteors.³ Between magnitudes +6 and +9 the average velocity of meteors detected on the radar system has changed by 5 km sec⁻¹. This is attributed to the smaller orbits shown by the fainter meteors. The faint meteors show total fragmentation as they enter the upper atmosphere of the earth. In general, each meteor disintegrates into several hundred fragments, which together act as a cloud of independent particles.

The objective of the Photographic Meteorite Recovery Program,⁸ under the direction of Dr. McCrosky, is to photograph the trails of extremely bright meteors so that the corresponding meteorite impacts may be determined and a search instigated for the meteorites. In the past year the project has completed the design of the station buildings, the cameras, and the photoelectric and control systems; selected and leased land at 16 sites in the Midwest; selected local station attendants and their alternates at each site; completed 16 buildings to the point where they are ready to receive cameras and begin operation; assembled, in Lincoln, Nebr., a team of four field personnel to operate the network and to recover freshly fallen meteorites; operated a prototype station at Havana, Ill., for 3 months; and initiated production on all major components of the stations.

The program for measuring radioactivities in material from outer space has continued on an expanded scale. In addition to tritium and argon radioactivities, Dr. Edward L. Fireman and his associates are now measuring carbon-14 and gamma-ray radioactivities from such isotopes as aluminum-26, manganese-54, sodium-22, and cobalt.

During the past year Dr. Fireman and James C. DeFelice have measured tritium, argon-37, and argon-39 in several meteorites, including the recently fallen Peace River. The resultant data provide comparative information on the production, intensity, and constancy of cosmic rays in space during a period of minimal solar activity. The absence of argon-39 in the Potter and Estacado meteorites indicates that they fell more than 1,500 years ago. The Estacado meteorite has been erroneously associated with an 1882 fireball. The argon-39 and tritium contents of Farmington are similar to those of other chondrites, but the aluminum-26 content of Farmington is a factor of more than 50 lower than in other chondrites. The content of these radioactivities permits the determination of the exposure age from radioactive isotopes alone. The cosmic-ray exposure age of the Farmington meteorite is between 7,000 and 25,000 years.

Studies of tritium concentrations in the metal phases of stony meteorites and in iron meteorites have continued during the past year. Dr. Fireman, Dr. David Tilles, and Mr. DeFelice plan further measurements to test the tentative hypothesis that tritium is lost from

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kamacite and retained in taenite. Measurements of tritium in the Sputnik IV fragment and studies by Dr. Tilles of tritium retention in a proton-irradiated target have provided additional data on the retention and loss of tritium in iron and steel.

Dr. Tilles has nearly completed assembling the parts of the high-sensitivity mass spectrometer⁹ for studies of noble gases in meteorites. Anticipated research studies with the spectrometer will include measurements of noble gas abundance and isotopic composition in separated phases of meteorites.

Problems in the mineralogy and petrology of meteorites, with special reference to their temperature-pressure history and age, are being considered. In the course of these studies,¹⁰ Mrs. Ursula B. Marvin discovered zircon, heretofore unknown in meteorites, in the Vaca Muerta mesosiderite. The zircon, which is radioactive, is of special significance in age determinations of any meteorite where it occurs. As part of a long-term project in collaboration with Dr. Fireman, Mrs. Marvin has separated mineral concentrates of high purity from Indarch, a stony meteorite abnormally rich in xenon and containing the rare minerals CaS and MgS. She will study the mineralogy and petrology of this meteorite in detail. The radioisotope group will make age determinations on the separated fractions and a bulk sample.

Initiating a program of study of the chemical compositions of microstructures in chondrites, Dr. John A. Wood used the electron microprobe in the University of Chicago Division of Geological Sciences as an analytical tool.¹¹ At present, the focus of the study is the grains and particles of nickel-iron metal present in chondrites. The compositions and compositional gradients in these are determined by the thermal history of the chondrite containing them. This study should hence yield information about the nature and thermal history of the planet from which the chondrites were derived.

Dr. Wood has also made a detailed theoretical study of the properties of the most common class of meteorite, the chondrites, in an attempt to understand the processes that operated to produce them.¹² He also studied the thermal history of nickel-iron phases and their compositional gradients in iron meteorites. This involved the use of a digital computer to solve the diffusion equation of nickel in nickel-iron alloys for various postulated cooling rates and thermal histories.¹¹ He found a thermal history that yielded the same nickel diffusion profiles observed in iron meteorites. Preliminary results indicate that the medium octahedrite iron meteorites originated in a small planet, about 200 km in radius; that this object originally accreted at a rate of ~ 0.5 cm per year; and that it originally contained a short-lived radionuclide (~ 100 ppm of Al²⁶ or the equivalent), which

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in decaying provided the planet with a pulse of high temperature followed by rapid cooling. Dr. Wood spent most of the past fiscal year at the Enrico Fermi Institute for Nuclear Studies, University of Chicago, working with Dr. Edward Anders on meteorite research.

Dr. F. Behn Riggs, Jr., completed his investigation¹³ of the use of an electron probe specially designed to use with very large meteorite sections without enclosing the specimen in a vacuum chamber. Several meteorites were studied with this instrument.

To facilitate interpretation of metallurgical features of meteorites¹⁴ Dr. Matthias F. Comerford (in cooperation with Prof. H. H. Uhlig of M.I.T.) and Joseph I. Goldstein (in cooperation with Prof. R. E. Ogilvie of M.I.T.) are pursuing separate investigations of diffusion processes at the interface of two different specimens of nickel-iron alloy. The dependence of the interdiffusion coefficients upon both temperature and pressure is being measured. Pressures up to 50,000 atmospheres are being used in these experiments.

Dr. Wright and Dr. Paul W. Hodge are pursuing a project to determine the amount and nature of extraterrestrial particles collected by the earth. This investigation has been furthered through collection, by diverse methods, of particles from a wide variety of geographical locations. The collected particles were microscopically examined and their chemical and physical properties determined. A total of 761 particles of possible extraterrestrial origin have been chemically analyzed with electron-probe techniques. The results are proving useful in establishing the chemical criteria for cosmic origin.

Cometary science.—Comets have frequently been investigated by Smithsonian Observatory scientists. A basic understanding of their composition, structure, and resultant phenomena promises to clarify important aspects of the origin of the solar system. The relationship of comets to meteor showers and the response of comets to solar activity are likewise important topics.

Currently, Dr. Whipple is directing his attention to the problem of the cometary nucleus as evidenced in the brightness and deterioration of the periodic comets. Starting from a combination of meteor and cometary studies he is performing calculations to ascertain more exactly the lifetime of a major comet such as Encke's, which has contributed a great complex of Taurid meteors. He is seeking to identify Comet Encke in ancient records in order to determine changes in period and brightness levels in the ancient past—perhaps 2,500 years ago. This research employs studies of photographic meteor orbits, theoretical calculations, and cooperation with historians.

Published photographs of Comet Arend-Roland, examined by Dr. Richard B. Southworth, combined with computed particle trajectories,

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showed that the comet had seven tails. Each consisted of dust ejected in accordance with Whipple's theory describing this process. The larger ejected particles collectively contain more mass than the small.

Using photographs made by the Baker-Nunn cameras, Daniel Malaise¹⁵ is obtaining measurements of cometary tail activity. This inquiry bears on the interaction of the solar wind with the tails of comets.

During the summer of 1962 Dr. Pol Swings reviewed the possibilities for cometary research provided by the use of rocket vehicles and spacecraft. Observations of infrared and ultraviolet frequencies from orbiting observatories, measurements from a probe flight near a comet, and release of appropriate chemicals from rockets all offer significant opportunity for advancing cometary science.

Dr. Charles A. Whitney and Dr. Lundquist have initiated laboratory studies of the properties of ices in vacuum to provide several basic parameters for further theoretical descriptions of comets. Preliminary theoretical studies of the nature of comets have indicated the need for several modifications of existing theories.

Solar observations.—A historic advance in solar observation is the United States' Orbiting Solar Observatory program. To further its long-standing record of pioneering solar observations, SAO is playing an active role in this program.

Dr. Giovanni Fazio was a coexperimenter on the first Orbiting Solar Observatory, launched in March 1962. The experiment provided the first view of a solar flare in the high-energy gamma ray (>100 Mev) portion of the electromagnetic spectrum. Within the sensitivity of the detector, there was no evidence for gamma radiation. Data reduction¹⁶ is continuing, and theoretical calculations on the sun's production of gamma rays have been made.

Dr. Leo Goldberg is directing a Harvard University project¹⁷ to prepare instrumentation for the second Orbiting Solar Observatory, scheduled to be launched during the fall of 1963. The instrument is designed both to make scans of the solar spectrum and to obtain monochromatic solar images in the wavelength range 500–1500 Å. Both the prototype and the flight models of the satellite instrument have been delivered for integration into the spacecraft. A considerable number of the routine environmental tests have been passed.

Design work has already begun on an improved model of the scanning spectrometer-spectroheliograph, which has been allocated space on board the fourth Orbiting Solar Observatory. Design work is also proceeding on a spectrometer that will operate in the short wavelengths from 100–600 Å.¹⁸

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Observations of magnetic fields and velocity fields in the solar granulation were carried out by Dr. R. W. Noyes at the McMath Solar Telescope at Kitt Peak National Observatory in Tucson during June 1963. The data are now being analyzed.

Dr. Fireman, Dr. Tilles, and Mr. DeFelice have continued measurements of tritium concentrations in recovered satellites. Such measurements made during the past year have pertained to a period of relative solar quiescence. The apparent upper limit for trapped tritium abundance was much lower in 1962 than it was following the November 1960 solar flares. The measurements to date suggest that these large flares injected tritium into the trapped radiation belts with apparent lifetimes of months. This first evidence of direct solar injection of positive Van Allen particles is under continuing critical examination.

It is clear that particles and electromagnetic radiation from the sun produce many such diverse phenomena in the solar system. Their interaction with the earth's atmosphere results in large density variations which are manifest in variations of satellite orbits. These radiations also influence cometary activity. The interpretation of these far-reaching interrelated phenomena is particularly challenging because of its very scope. The present period of minimum solar activity has many advantages for research on these matters. The Observatory is vigorously pursuing these topics, which will be included in the U.S. program for the Year of the Quiet Sun.

Stellar observations.—The Observatory's astrophysical interests extend beyond the investigations of the solar system. Using various instruments, SAO acquires and analyzes observational data on stars, galaxies, and interstellar matter in all forms.

Like solar observations, stellar observations stand to benefit greatly from the advent of orbiting observatories. The Observatory is privileged to have responsibility for Project Telescope,¹⁹ one of the two prime experiments on the first Orbiting Astronomical Observatory. Dr. Whipple is project director, and Dr. Robert J. Davis is project scientist. Dr. Grossi has supervised electronic aspects of the project.

The primary goal of Project Telescope is to obtain ultraviolet star catalogs in each of four colors between 1,000 and 3,000 Å. The wavelength range requires that this observing program be carried out above the earth's atmosphere. Four separate telescopes equipped with ultraviolet-sensitive television photometers will be used. The present phase of the program is concerned primarily with procurement of the necessary equipment. The experiment has required the development of the following pioneering instrumentation and techniques:

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ultraviolet-sensitive television camera tubes, Schwarzschild telescope systems, calibration lamps, a digital television photometric system, and automatic identification and cataloging of stars.

The ultraviolet-sensitive television camera tubes required much research and development. The Project has been working for 4 years with Westinghouse Research Laboratories to procure these devices. Problems solved during the past year include Westinghouse's development of a new target material that has increased the tube's sensitivity and its suitability as a stellar photometer. Laboratory measurements of the spectral response of this tube were made by Dr. Om P. Rustgi.

The telescope system to be used with Celeste requires the production of strongly aspheric optical surfaces mounted so as to survive the mechanical environment of satellite launching, and to be insensitive to large variations in temperature.

For calibration of Celeste equipment in orbit, it was necessary to obtain two types of ultraviolet point sources. One, utilizing a low-pressure mercury-vapor arc, radiates intensely at 2,537 Å. The other, utilizing a low-pressure xenon arc, radiates intensely at 1,470 Å. The latter lamp required considerable developmental work in order to meet requirements for small size and power consumption, long life, and high efficiency. Dr. Rustgi and Clifford Miles have made laboratory tests of these sources.

The requirement to use a television system as a stellar photometer posed problems of accuracy, reliability, linearity, and dynamic range not encountered in the usual type of television data transmission. The system, as developed by Electro-Mechanical Research, Inc., has proved able to meet the performance requirements.

Finally, George Szabo, Mrs. Gail Wald, and Stephen Strom have prepared an ultraviolet identification catalog and are preparing techniques for automatic compilation and publication of the Celeste observational material.

The accurate measurement of the number and direction of high-energy gamma rays from the universe is a difficult instrumentation problem. The importance of the measurement, however, justifies great effort toward its accomplishment. Dr. Fazio has completed a theoretical study of the production of gamma rays by cosmic radiation in our galaxy. Using the results of these calculations, he is planning further gamma-ray astronomy instruments for future orbiting observatories. A new type of detector for high-energy gamma rays, a multiple spark chamber, is now being developed at the Observatory.

A program of spectroscopic observations of bright stars, which Dr. Whitney initiated at the Agassiz Station of Harvard College Observatory, will provide data for the theoretical work on the spectra of normal stars. Drs. Wright and Hodge have located Population II

Cepheids in the Large Magellanic Cloud, in red globular clusters. A period-luminosity relation for these Cepheids has been established. This research is helpful in determining the extragalactic distance scale.

Six of the Baker-Nunn cameras have been used since 1960 to photograph flare stars in conjunction with radio-frequency measurements of their radio emissions.¹ The cooperating radio observatories are Jodrell Bank Experimental Station in England and the Commonwealth Scientific and Industrial Research Organization at Sydney, Australia. Leonard Solomon devised the photographic procedures used. The one major flare observed this year correlates in time with a major burst detected in the radio spectrum at Sydney. If these combined observations are significantly correlated, as they appear to be, they constitute the first observations of radio energy from "normal" stellar objects. Many minor flares (from previous years) correlate with small bursts observed at Jodrell Bank.

In collaboration with Prof. William Liller of Harvard, Dr. Goldberg has begun an observing program designed to search for evidence of cyclic stellar activity similar to that connected with the solar sunspot cycle. They will conduct the search by monitoring the intensities of the H and K emission lines of ionized calcium in the spectra of late-type stars. They will look for both short-term changes, such as may be produced by flares, and long-term cyclic variations.

A star catalog¹ of great value to many astronomical enterprises has been completed under the direction of Dr. Vies, Mr. Solomon, and Mrs. Katherine Haramundanis. Initiated in 1959 under the Satellite Tracking Program, the SAO Star Catalog was conceived as the compilation of a large number of fundamental and differential catalogs to cover the sky in a standard coordinate system. The project used about 40 catalogs, providing data on approximately a quarter of a million stars. Preparation of the Star Catalog involved investigations of the details of the coordinate system and derivation of proper motions of each catalog. Comparisons of several catalogs were also made in sky areas where the catalogs used did not provide adequate information, usually for proper motions. The complete catalog is stored on magnetic tape, while the publication of a book form is progressing. A set of star charts is to be produced from the Catalog in Lambert-conformal projection, probably at two different scales.

Stellar theory.—Theoretical studies of stellar atmospheres²⁰ continued in several directions under Dr. Whitney's supervision. Extensive calculations were performed concerning the structure of stellar convection zones and the nature of the perturbations they produce in stellar atmospheres. Investigations of the structure of shock fronts in

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atomic hydrogen have been extended; these represent a considerable refinement of the earlier work. Dr. Angelo J. Skalafuris and Dr. Wolfgang Kalkofen worked with Dr. Whitney on the latter studies. Dr. Owen Gingerich has examined some computational aspects of nongray stellar atmosphere models. In this connection, he has investigated several new opacity sources. Current work includes the addition of electron-scattering and absorption-line profiles to the computer program.

Dr. Max Krook has developed a perturbation-iterative procedure for solving the structure equations for nongray stellar atmospheres. He and Dr. Eugene H. Avrett have applied this method to a number of cases and have found it to converge very rapidly.

Dr. Noyes has made theoretical investigation of velocity fields in the solar atmosphere. The purpose of this work is to explain the recent observations of pronounced oscillatory motions in the solar atmosphere. Particular goals are to reproduce the well-determined period of 300 seconds for the oscillation. The relevant equations, including the effects of radiative damping, have been put in a form suitable for numerical analysis on an IBM-7090 computer. Preliminary results indicate that rapid change in radiative flux into the atmosphere, induced by convection in the granulation, does indeed cause oscillatory motions of the solar atmosphere with the observed properties.

In collaboration with Dr. Y. Öhman of the Stockholm Observatory, Dr. Goldberg is carrying out a theoretical investigation of the scattering of the Lyman- α emission line by the high-speed electrons of the solar corona. Profiles of the scattering emission line are being calculated for various assumed models of the corona as a function of distance from the center of the solar disk.

The radiation pressure exerted on a nonstationary gaseous cloud by a neighboring exciting star of high temperature has been considered by Dr. Y. Hagihara.¹ He has employed quantum mechanical techniques and the assumptions that the atmosphere and the ions in the cloud are in systematic and random thermal motions.

Summary.—During the past year we have once more witnessed the ever-increasing recognition of astrophysical research as an essential component of the scientific needs of the nation. A previously unheard-of situation now exists in which major national programs—such as manned lunar exploration in this decade—depend on astrophysical information for their successful execution.

The Smithsonian Astrophysical Observatory is proud that for 73 years it has been generating and disseminating such knowledge. We also derive satisfaction from our realization that the research pro-

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grams of the Observatory have grown and continue to grow as the appropriate Smithsonian Institution response to these requirements.

OTHER ACTIVITIES

On June 11, in ceremonies at the White House, Dr. Whipple received the President's Award for Distinguished Federal Civil Service.

Dr. Whipple and Drs. Fireman, Wood, and Tilles attended the Gordon Research Conference at Tilton, N.H., in July 1962.

In August Dr. Avrett participated in the Third Colloquium on the Theory of Stellar Atmospheres, sponsored by Commission 36 of the International Astronomical Union, at Hailsham, England.

Dr. Colombo presented a paper at the Symposium on Gyrodynamics, sponsored by the IUTAM, at Celerina, Switzerland.

In September Dr. Lundquist presented a paper at the 13th International Astronautical Conference at Varna, Bulgaria.

¹ Supported by grant NsG 87/60 from the National Aeronautics and Space Administration.

² Supported by contract 19(628)-3248 with the U.S. Air Force.

³ Supported by grants G20135 and GP388 from the National Science Foundation to Harvard University and by grant NASr-158 from the National Aeronautics and Space Administration to Harvard University.

⁴ Supported by contract 19(628)-2949 with the U.S. Air Force.

⁵ Supported by contract AF19(604)5196 between the U.S. Air Force and Harvard University.

⁶ Supported by grant number NsG 126/61 from the National Aeronautics and Space Administration to the University of California.

⁷ Supported by contract AF19(604)7400 sub 234 between Harvard University and MIT Lincoln Laboratory.

⁸ Supported by grant NsG 291-62 from the National Aeronautics and Space Administration.

⁹ Supported by grant NsF 16067 from the National Science Foundation.

¹⁰ Supported in part by grant NsG 282-63 from the National Aeronautics and Space Administration to Dr. Clifford Frondel of Harvard University.

¹¹ Supported by grant G 14298 from the National Science Foundation to the University of Chicago.

¹² Supported by contract AT(11-1) 382 between the Atomic Energy Commission and the Enrico Fermi Institute for Nuclear Studies, University of Chicago.

¹³ Supported by contract AF18(600)-1596 with the U.S. Air Force.

¹⁴ Research supported by grant G2777 from the National Science Foundation to the Massachusetts Institute of Technology.

¹⁵ Research sponsored by fellowships from NASA, Fonds National de la Recherche Scientifique, Belgium, and European Preparatory Commission for Space Research.

¹⁶ Supported by grant NAS5-3255 from the National Aeronautics and Space Administration.

¹⁷ Supported by contract NASw184 between the National Aeronautics and Space Administration and Harvard University.

¹⁸ Supported by grant NsG-438 from the National Aeronautics and Space Administration to Harvard University.

¹⁹ Supported by contract NAS5-1535 with the National Aeronautics and Space Administration.

²⁰ Research supported by grants G-16339 and GP940 from the National Science Foundation.

Dr. Carleton presented a paper at the annual Gaseous Electronics Conference at Boulder, Colo., in October.

Dr. Fazio presented a paper at the 1962 International Symposium on Space Phenomena and Measurements in Detroit.

In November Dr. Fireman presented a paper at the Radioactive Dating Symposium in Athens, Greece. In December he attended the American Association for the Advancement of Science meeting in Philadelphia.

Dr. Tilles, Mrs. Marvin, and Mr. Slowey presented papers at the American Geophysical Union meeting at Stanford University, Palo Alto, Calif., in December.

In January Dr. Whipple delivered a lecture at the Ninth Annual Astronautical Society Meeting in Los Angeles. He also attended ceremonies at the Goddard Space Flight Center commemorating the fifth anniversary of international tracking of space vehicles.

Drs. Carleton, Lundquist, and Mitler attended the meeting of the American Physical Society in New York.

Drs. Lundquist, Fazio, and Jacchia attended the Goddard Scientific Symposium on Satellites in Washington, D.C. Dr. Fazio presented a paper at this meeting.

In April, Dr. Whipple took part in the Institute of Space Studies Symposium on the Origin and Evolution of Atmospheres and Oceans, held in New York City. He also presented a paper at the UGI meeting in Washington.

Drs. Carleton, Fazio, Fireman, Jacchia, Tilles, and Whipple attended the American Geophysical Union meeting in Washington.

Drs. Whipple, Jacchia, and Sagan presented papers at the COSPAR meeting in Warsaw, Poland, in June. Dr. Sagan also attended the 12th International Astrophysical Colloquium in Liège, Belgium.

BUILDINGS AND EQUIPMENT

In October 1962 and June 1963 several divisions of the Observatory, including those occupying space belonging to the IBM Corp. and to the Harvard University Press, moved to a building on Alewife Brook Parkway, about a mile from Observatory headquarters at the Harvard College Observatory. This move places all personnel in only two locations, between which mail- and passenger-shuttle operates on a regular schedule.

Also in October 1962 the IBM-7090 computer was taken over by, and moved to, the Harvard Computing Laboratory, from which the Observatory rents needed time.

PUBLICATIONS

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The Special Reports of the Astrophysical Observatory distribute catalogs of satellite observations, orbital data, and preliminary results of data analysis prior to journal publication. Numbers 99 through 126, issued during the year, contain the following material:

No. 99, July 16, 1962.

Chemical analysis of 643 particles collected by high-altitude aircraft and balloons, by F. B. Riggs, Jr., F. W. Wright, and P. W. Hodge.

No. 100, July 30, 1962.

Accurate drag determinations for eight artificial satellites; atmospheric densities and temperatures, by L. G. Jacchia and J. Slowey.

No. 101, July 31, 1962.

Numerical results from orbits, by Y. Kozai.

No. 102 (P-5), August 27, 1962.

Catalog of precisely reduced observations: Satellite 1959 α 1 for the entire year 1960, prepared by J. MacDonald, K. Haramundanis, et al.

No. 103, August 28, 1962.

Satellite orbital data: Satellite 1959 Eta (Vanguard III), Sept. 1, 1960–Dec. 31, 1961, and Satellite 1960 α 1 (Echo I), Jan. 1–Dec. 31, 1961, by B. Miller, compiled by I. G. Izsak.

No. 104 (P-6), September 10, 1962.

Catalog of precisely reduced observations: Satellite 1961 β 1 from launch Feb. 16–June 30, 1961, prepared by J. MacDonald et al.

No. 105, September 28, 1962.

The trajectory of tektites, by G. S. Hawkins and S. K. Rosenthal.

No. 106 (P-7), November 1, 1962.

Catalog of precisely reduced observations: Satellite 1959 α 1 from Jan. 1–June 30, 1961; Satellite 1959 η 1 from Jan. 1–June 30, 1961, prepared by P. Stern.

No. 107, November 9, 1962.

On some singular orbits of an earth-moon satellite with a high area-mass ratio, by G. Colombo and D. A. Lautman.

No. 108, November 20, 1962.

On the libration orbits of a particle near the triangular point in the semi-restricted three-body problem, by G. Colombo, D. A. Lautman, and C. Munford.

No. 109, December 21, 1962.

Re-entry and recovery of fragments of satellite 1960 ϵ 1, by C. A. Lundquist, R. C. Vanderburgh, W. A. Munn, D. Tilles, E. L. Fireman, and J. DeFelice.

No. 110, December 14, 1962.

Project Telescope, an astrophysical reconnaissance satellite, edited by R. J. Davis.

No. 111, December 15, 1962.

Possible contributions of space experiments to cometary physics, by P. Swings.

No. 112, January 21, 1963.

On the secular decrease in the inclination of artificial satellites, by R. C. Nigam.

- No. 113, January 23, 1963.
 Satellite orbital data: Satellite 1958 Alpha, Apr. 1–July 1, 1962, by B. Miller; Satellite 1959 α 1, Mar. 31–June 30, 1962, by M. Gutierrez; Satellite 1959 Eta, Mar. 31–June 30, 1962, by M. Hall; Satellite 1959 δ 1, Mar. 31–June 30, 1962, by M. Gutierrez; Satellite 1960 ξ 1, Apr. 1–July 1, 1962, by M. Hall; Satellite 1961 δ 1, Mar. 31–June 30, 1962, J. Weingarten, compiled by I. G. Izsak.
- No. 114 (C-31), January 28, 1963.
 Catalogue of satellite observations: Satellites 1958 Alpha, 1959 α 1, 1959 Eta, and 1959 δ 1 for Jan. 1–June 30, 1962, prepared by B. Miller.
- No. 115 (C-32), January 29, 1963.
 Catalogue of satellite observations: Satellites 1960 δ 1, 1960 ϵ 2, and 1960 ξ 1, for Jan. 1–June 30, 1962, prepared by B. Miller.
- No. 116 (C-33), January 30, 1963.
 Catalogue of satellite observations: Satellites 1961 δ 1, 1961 α 1, and 1961 α 2, for Jan. 1–June 30, 1962; Satellite 1961 ν 1, Jan. 1–Sept. 19, 1962; Satellite 1962 ζ 1, Mar. 7, 1962; Satellite 1962 δ 1, Apr. 8–May 16, 1962; Satellite 1962 ϵ 2, Apr. 8–May 4, 1962; Satellite 1962 γ 2, May 4–17, 1962; Satellite 1962 α 1, Apr. 28–May 20, 1962; Satellite 1962 α 2, Apr. 28–May 4, 1962; Satellite 1962 $\alpha\alpha$ 1, June 20–Aug. 8, 1962, prepared by B. Miller.
- No. 117, February 11, 1963.
 Satellite orbital data: Satellite 1958 Alpha, Jan. 1–Apr. 1, 1962, by B. Miller; Satellite 1959 α 1, Aug. 1, 1961–Mar. 31, 1962, by M. Gutierrez; Satellite 1959 Eta, Jan. 1–Apr. 1, 1962, by M. Hall; Satellite 1959 δ 1, Jan. 1–Apr. 1, 1962, by B. Miller; Satellite 1960 δ 1, Jan. 1–Apr. 30, 1962; Satellite 1960 ξ 1, Jan. 1–Apr. 1, 1962, by M. Hall; Satellite 1961 δ 1, Jan. 1–Mar. 31, 1962, by J. Weingarten; compiled by I. G. Izsak.
- No. 118 (P-8), February 14, 1963.
 Catalog of precisely reduced observations: Satellites 1959 α 1, 1959 Eta and 1960 ϵ 2, July 1–Dec. 31, 1961, compiled by P. Stern.
- No. 119 (E-2), March 15, 1963.
 Satellite orbital data: Satellite 1959 α 1, Jan. 1, 1960–Dec. 31, 1961; Satellite 1959 α 2, Apr. 6–Aug. 26, 1960; Satellite 1959 Eta, Jan. 1, 1960–Dec. 31, 1961; Satellite 1960 ϵ 2, Mar. 14–Dec. 31, 1961; Satellite 1961 δ 1, Feb. 18–Dec. 31, 1961, by P. Stern; compiled by I. G. Izsak.
- No. 120, March 18, 1963.
 Satellite orbital data: Satellite 1958 Alpha, July 1–Sept. 30, 1962, by B. Miller; Satellites 1959 α 1, 1959 Eta, and 1959 δ 1, July 1–Sept. 30, 1962, by M. Gutierrez; Satellites 1960 ξ 1 and 1961 δ 1, July 1–Sept. 30, 1962, by J. Weingarten; Satellite 1960 δ 1, May 1–Sept. 30, 1962; compiled by I. G. Izsak.
- No. 121, April 1, 1963.
 Smithsonian Astrophysical Observatory program writeup (SCROGE), by J. R. Cherniack and E. M. Gaposchkin.
- No. 122, April 2, 1963.
 Combinations of least-squares approximations in the case of correlated variables, by P. L. Kadakia.
- No. 123, April 30, 1963.
 Precise aspects of terrestrial and celestial reference frames, by G. Veis.
- No. 124, May 27, 1963.
 Notes on the design and operation of satellite tracking stations for geodetic purposes, by the staff of the Smithsonian Institution Astrophysical Observatory.

No. 125, May 28, 1963.

An analysis of the atmospheric drag of the Explorer IX satellite from precisely reduced photographic observations, by L. G. Jacchia and J. Slowey.

No. 126, June 24, 1963.

Satellite orbital data: Satellite 1958 α , Oct. 1–Dec. 31, 1962, by B. Miller; Satellites 1959 $\alpha 1$, 1959 η and 1959 $\lambda 1$, Oct. 1–Dec. 31, 1962, by M. Gutierrez; Satellite 1960 $\gamma 2$, Apr. 13–May 30, 1960; Sept. 29–Oct. 23, 1962, by R. C. Nigam; Satellites 1960 $\lambda 1$, $\xi 1$ and 1961 $\delta 1$, Oct. 1–Dec. 31, 1962, by J. Weingarten; Satellite 1962 $\alpha \epsilon 1$, July 10–Dec. 31, 1962, by M. Gutierrez; Satellites 1962 $\beta \lambda 1$, Oct. 27–Dec. 20, 1962 and 1960 $\beta \mu 1$, Oct. 31–Dec. 31, 1962, by J. Weingarten; compiled by I. G. Izsak.

STAFF CHANGES

On July 22, 1962, Dr. Charles A. Lundquist joined the Observatory as assistant director for science. Other scientists who joined the staff during the year are physicists Dr. Eugene Avrett, Dr. Nathaniel P. Carleton, Dr. Charles Dugan, Dr. Giovanni G. Fazio, Dr. Owen Gingerich, Dr. William M. Irvine, Dr. Robert W. Noyes, Dr. Carl E. Sagan, Dr. Franco Verniani, and Chi-Yuen Wang; astronomer Dr. Gerald S. Hawkins; metallurgists Dr. Matthias Comerford and Joseph Goldstein; geodesist Dr. Walter Köhnlein; and Daniel Malaise, NASA-COPERS fellow. Jack Coffey was appointed personnel director, and Marc Malec was named contract specialist.

Resignations during the year included those of Thomas Noonan, Dr. F. Behn Riggs, and Dr. Om P. Rustgi, physicists; G. Nielson, administrative officer, Satellite Tracking Program; Dr. Pedro Zadunaisky and Rajendra C. Nigam, astronomers.

Consultants at the Observatory during the year were Dr. Gustav Bakos, Dr. Richard Giese, Dr. Yusuke Hagihara, Dr. Yoshihide Kozai, Dr. Otto Struve, Dr. Pol Swings, Dr. H. C. Van de Hulst, and Dr. George Veis.

On June 30, 1963, the Observatory employed 335 persons.

DIVISION OF RADIATION AND ORGANISMS

Prepared by W. H. KLEIN, Chief of the Division

The research program of the Division is concerned with the effects of solar and ionizing radiation on biological systems, with emphasis on developing systematic concepts of the metabolic mechanisms and responses of living organisms as influenced and regulated by radiation. Areas of concentrated effort include problems relating to the regulation of metabolism by radiation, the determination of structure and function of macromolecules involved in energy storage, the measurement of seasonal changes in spectral distribution of total sky radiation and the correlation of these changes with plant responses.

Plastids of flowering plants grown in the dark are converted to functional chloroplasts in the light. The antibiotic chloramphenicol partially inhibits light-dependent synthesis of whole leaf and chloroplast protein, and chloroplasts from chloramphenicol-treated leaves lack the ability to catalyze light-dependent formation of TPNH (reduced triphosphopyridine nucleotide) and ATP (adenosine triphosphate) which are needed for photosynthetic carbon dioxide fixation. Thus, nonfunctional plastids lack a number of structural proteins necessary for the generation of TPNH and ATP. Methods of isolating chloroplasts active in photoproduction of TPNH and ATP were examined. An unidentified inactivator was found in leaf homogenates. The presence of this inhibitor accounts for the previous difficulties encountered in obtaining chloroplasts active in photoproduction of TPNH and ATP.

The proteins of functional chloroplasts from treated and untreated leaves differ. Purified plastids from treated leaves contain a larger fraction of protein that can be made water soluble. Immunological analysis, however, shows that the soluble fraction from chloroplasts of control leaves contains more protein components. Differences are related to structural differences visualized with the electron microscope.

Unlike flowering plants, many algae form chloroplast pigments in the dark. However, differences in quantity and quality of light have been reported to affect pigmentation and photosynthetic capacity. A number of littoral diatom isolates were found to grow well in the dark. Similar pelagic isolates are being sought. Methods of quantitatively extracting chloroplast pigments are being developed to compare differences in pigmentation between organisms grown in light and dark.

Marine organisms are peculiarly suitable for fundamental investigation of radiation responses, and a section was organized within the division for marine biology research. The long-term aim of this study is toward establishing an adequate understanding of the physiology and biochemistry of the occurrence, behavior, and potential harvest of marine organisms.

In the sea, algae carry out the conversion of light energy to chemical energy. Phosphorus compounds are involved and play an important role in the determination of the bulk and growth rates of the algae. A number of types of phosphorus compounds in algae have been identified, quantitated, and used in structural studies. Metabolic activities of these compounds have been determined by the rate of incorporation of radioactive isotopes. Methylated ribose was demonstrated as a component of nucleotides of RNA (ribose nucleic acid)

fraction. A number of sugars and neuraminic acids were demonstrated to be bound to the RNA.

The morphological development of plastids in the presence of a carbohydrate substrate has been demonstrated to be controlled by the phytochrome pigment system which is photosensitive to red and far-red radiant energy. Microscopic examinations of leaf preparations show a red light-induced disappearance of starch from within young etiolated plastids. This observation has been substantiated by biochemical analysis which also indicated that starch degradation was preceded by a similar loss in total soluble sugars. In addition, these changes, which are appreciable in 6 hours and maximal in 12 hours following a 3-minute exposure to light, correlate with the pronounced photomorphogenic leaf expansion. Studies of the kinetics of these changes, of temperature sensitivity and energy requirements for induction and reversal, have been completed as a necessary preliminary to an intensive study of the enzyme systems involved.

Attempts to correlate physiological responses in a number of tissues to reported in vivo measurements of phytochrome concentrations have led to the conclusion that a simple one-pigment system appears to be inadequate in explaining the observed results. A far-red dose response curve was determined immediately after, and 1½ hours after red induction. The data show a significant increase in sensitivity to far-red after 1½ hours in both lettuce seed germination and bean hypocotyl hook opening. It was also observed that complete reversal of the induced response can be obtained with sufficiently large amounts of far-red energy from 2½ hours to 4½ hours after induction for both lettuce and bean. Further, there is significant reversal of the red induction for at least a 10-hour period in both.

Experiments using *Avena* mesocotyl inhibition in which non-inhibitory pretreatments of red irradiation were given 24 hours prior to inhibitory red treatments did not produce any change in sensitivity. The published in vivo measurements indicate that such pretreatments should have significantly reduced the level of phytochrome so that the sensitivity should have changed. Also, experiments in which red treatments were divided into two doses separated by 4-hour dark intervals, or given as one continuous dose, showed marked differences in the sensitivity to far-red reversal. These data do not fit reasonably with a single pigment system.

Many biological responses, such as flowering, pigment synthesis, seed germination, stem elongation, and leaf expansion are controlled by photochemical reactions initiated by various portions of the visible spectrum. In a program of study never previously undertaken anywhere, measurements of specific spectral regions of sun and sky radia-

tion are being recorded and correlated with plant growth responses of living material produced in natural daylight and in controlled environment conditions. The greenhouse and controlled environment rooms, with such special features as automatically controlled changing light intensities and daylengths to reproduce natural conditions, have been developed and installed. The system for measuring sun and sky radiation has been developed and includes specially constructed thermopiles with filters which automatically measure solar radiation. A digital recording system has been adapted, with automatic data processing equipment for handling a larger amount of information, to register all data on punched tape. Measurements are being made at 3-minute intervals for six different wavebands simultaneously. Direct measurements with photomultipliers using interference filters at two specific wavelengths, 660 and 730 $m\mu$, indicate that there is an appreciable shift of as much as two-fold in the ratio of red to far-red near sunrise and sunset. These shifts may be of significant import in determining the effective daylength for biological responses which utilize the phytochrome system.

The biological phase has been initiated, and at periodic intervals the plant material cultivated under precisely controlled conditions is observed and measured, and the data are recorded for purposes of comparison and correlation. It is expected that the degree and/or frequency of physiological responses initiated by photochemical stimuli will demonstrate a direct correlation with measured daily and seasonal fluctuations in the energy and quality of solar radiation as observed over relatively long periods of time.

It has been shown previously by Dr. W. M. Dugger, Jr., and Dr. O. C. Taylor at the Air Pollution Research Center, University of California at Riverside, that PAN (peroxyacetyl nitrate) is an oxidant, naturally present in smog, which produces necrotic lesions on young leaves in the presence of light. These previous observations also suggested that PAN might be affecting the photosynthetic system of the plant. Thus, an attempt was made to determine if the intracellular site of PAN action could be determined. The spectral sensitivity of the light requirement in producing damage in bean seedlings in the presence of the smog oxidant was determined cooperatively with Drs. Dugger and Taylor, and this action spectrum indicates an interaction with a carotenoid pigment having a strong absorption between 400 and 500 $m\mu$. There is a residual small amount of damage for all wavelengths out to 700 $m\mu$.

A concentration of 4 ppm PAN for 100 seconds with an intensity of 200 $\mu W/cm^2$ produces appreciable leaf damage. No leaf damage is observed if plants are kept in the dark immediately prior to or immediately following the fumigation with PAN with simultaneous

light exposure. Thus the damage is indicated to be mediated not by chlorophyll directly, but through accessory carotenoid pigments in the photosynthetic system.

In the study of the photoresponses of *Phycomyces blakesleeanus*, detailed action spectra for the growth and tropic responses at high intensities have been completed. Within the visible range, the spectra are identical, indicating that no detectable bleaching of the photoreceptor occurs. It is concluded that direct spectrophotometric measurements for the detection of in vivo changes in the pigment photoreceptor system would be unprofitable.

Chromatographic and biochemical assays have been made of various compounds extracted from sporangiophores. These compounds include amino acids, reducing and nonreducing sugars, carotenoids, flavins, and various phosphorylated compounds. Dark-grown or light-adapted sporangiophores were exposed to saturating pulse-up light stimuli and assays made at 1-minute time intervals after the stimuli.

No detectable changes could be observed for carotenoids or amino acids. Significant changes both in quantity and quality of compounds present were observed between adapted and stimulated growing zones for flavins in stage I and IV sporangiophores. Quantitative changes were also observed for reducing sugars. The time course of these changes can be correlated with the observed time course of the light growth response.

One of the observed flavins, a blue fluorescing unknown, is present in large amounts in light-sensitive stages of sporangiophore development and is not found in the light-insensitive mycelia or during formation of the yellow sporangium in stage III sporangiophores. The total amount of this material is also a function of the adaptation level of the sporangiophore with the highest concentration occurring in dark-adapted sporangiophores.

The installation of a carbon-dating laboratory within the division was completed in September 1962, and the dating of a number of archeological samples has been completed. In addition to the service function, the carbon-dating program includes basic research in the techniques of dating by the use of the carbon-14 method and research employing this method as a tool.

The innovation of the use of mercury as the principal shielding material in the counting system has been most satisfactory and has resulted in low background levels and high precision. The absolute dates obtained with the mercury system are reliable when compared to those obtained by other laboratories.

A research project to determine the residence time of water in various systems was started in October 1962. Preliminary experiments

indicate that the carbon-14 activity of ground or surface water can be readily determined and that this method can be used to determine several of the hydrologic characteristics of water-producing strata. Instrumentation for this research has been completed and includes: (1) apparatus for extracting the bicarbonate and dissolved carbon dioxide from the water samples and (2) a system to convert the carbon dioxide to pure methane gas.

PUBLICATIONS

- PRICE, LEONARD, AND KLEIN, WILLIAM H. Chlorophyll synthesis in X-irradiated etiolated bean leaf tissue. *Radiation Botany*, vol. 1, pp. 269-275, 1962.
- KLEIN, WILLIAM H. Some responses of the bean hypocotyl. *American Biol. Teacher*, vol. 25, pp. 104-106, 1963.
- SHROPSHIRE, W., JR. Photoresponses of the fungus *Phycomyces*. *Physiol. Rev.*, vol. 43, pp. 38-67, 1963.
- SISLER, EDWARD C., AND KLEIN, WILLIAM H. The effect of age and various chemicals on the lag phase of chlorophyll synthesis in dark grown bean seedlings. *Physiol. Plantarum*, vol. 16, pp. 321-328, 1963.
- DUGGER, W. M., JR.; TAYLOR, O. C. KLEIN, W. H.; AND SHROPSHIRE, W., JR. Action spectrum of peroxyacetyl nitrate damage to bean plants. *Nature*, vol. 198, pp. 75-76, 1963.

OTHER ACTIVITIES

The division was represented during the year at a number of scientific meetings. At the American Institute of Biological Sciences meeting in August at Oregon State University, Corvallis, Oreg., were W. Shropshire, L. Price, M. M. Margulies, R. L. Latterell, and W. H. Klein. Papers presented at the meetings included "The Effect of Light and Chloramphenicol on Development of Photosynthetic Activities of Leaves," by M. M. Margulies; "Responses of *Phycomyces* to High Intensity Light," by W. Shropshire; and "Some Responses of the Bean Hypocotyl," by W. H. Klein. Dr. Klein attended the executive committee sessions of the American Society of Plant Physiologists.

Dr. D. L. Correll traveled to Woods Hole Oceanographic Institution, Yale University, and the Haskins Laboratories to confer on aspects of marine biology research. In August Dr. Klein with a representative of the U.S. Atomic Energy Commission visited the University of Washington at Seattle. J. H. Harrison attended the Intermediate Seminar for Scientific Glass Blowers held at the State University of New York in Alfred in September. In November, J. J. Sigalove and Dr. W. H. Klein went to Delaware, Ohio, to consult with Dr. J. G. Ogden of the carbon-dating laboratory at Ohio Wesleyan University. In January Dr. D. L. Correll and L. Lott made a collecting trip to the Florida Keys for specimens of marine algae.

Leonard Price and Dr. K. Mitrakos in February presented a symposium paper entitled "Photomorphogenesis and Carbohydrate Changes in Etiolated Leaf Tissue," at the 1963 meeting in Memphis, Tenn., of the Association of Southern Agricultural Workers. Also in February, Dr. W. Shropshire attended the 7th Annual Meeting of the Biophysical Society in New York City.

In April, the division was represented at three scientific meetings. Drs. P. J. A. L. deLint and D. L. Correll attended the annual meeting of the Federation of American Societies for Experimental Biology. J. H. Harrison attended the International Conference on Nonlinear Magnetics in Washington, D.C. Dr. Shropshire was an invited participant in the First American Meeting of the Royal Microscopical Society held at the National Institutes of Health.

J. J. Sigalove conferred in May with Dr. W. Broecker and the staff at Lamont Geological Observatory in Palisades, N.Y.

With the closing of the Table Mountain, Calif., Field Station, solar-radiation standards and some equipment were transferred to the division. The standards are being used in the calibration of instruments for measurement of solar radiation.

New members of the staff this year are Dr. David L. Correll, biochemist, and Joel J. Sigalove, geochemist. At the end of the year there were 29 members of the staff of the Division of Radiation and Organisms.

Respectfully submitted.

FRED L. WHIPPLE, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution

Report on the National Collection of Fine Arts

SIR: I have the honor to submit the following report on the activities of the National Collection of Fine Arts for the fiscal year ended June 30, 1963:

SMITHSONIAN ART COMMISSION

The 40th annual meeting of the Smithsonian Art Commission was held in Washington on Tuesday, December 4, 1962. Members present were Paul Manship, chairman; Leonard Carmichael, secretary; Gilmore D. Clarke, David E. Finley, Lloyd Goodrich, Bartlett H. Hayes, Jr., Ogden M. Pleissner, Charles H. Sawyer, and Stow Wengenroth. James C. Bradley, Assistant Secretary; Theodore W. Taylor, Assistant to the Secretary of the Smithsonian Institution; and Thomas M. Beggs, Director, National Collection of Fine Arts, were also present.

Resolutions on the deaths of Robert Woods Bliss and Archibald G. Wenley were submitted and adopted.

The Commission recommended appointment of Edgar P. Richardson to fill the vacancy caused by the death of Mr. Wenley, and of Paul Mellon, to fill that caused by the death of Mr. Bliss.

Recommendations were made for the reappointment of Gilmore D. Clarke, Stow Wengenroth, and Andrew Wyeth for the usual 4-year period.

The following officers were elected for the ensuing year: Paul Manship, chairman; Gilmore D. Clarke, vice chairman; and Leonard Carmichael, secretary.

The following were elected members of the executive committee for the ensuing year: David E. Finley, chairman; Gilmore D. Clarke, Ogden M. Pleissner, Edgar P. Richardson, with Paul Manship and Leonard Carmichael, *ex officio*.

Dr. Carmichael reported to the Commission on the progress in developing the old Patent Office Building to house the National Portrait Gallery and the National Collection of Fine Arts. He stated that plans had been submitted to the General Services Administration and that it was expected funds would be available to begin remodel-

ing in the winter of 1963-64, with possible completion of the galleries in January 1966.

A resolution was unanimously passed that the Smithsonian Art Commission "approves acceptance by the National Collection of Fine Arts of those examples of the work of Paulanship, sculptor, both unique and of duplicate or multiple casting as he may leave to the gallery by last will and testament. In acceptance of these works, it will be understood that they shall not be subject to use as part of a lending collection but shall be accorded treatment as permanent accessions, subject to occasional loans for special exhibition, rotation on display in the continuing exhibition, and other normal uses to which regular acquisitions are put."

The Commission recommended acceptance of the following for the National Collection of Fine Arts:

Terracotta, *Myron T. Herrick* (1854-1929), by Paulanship (1885-). Offered by the sculptor, New York City.

Marble, *Somnambula*, by Randolph Rogers (1825-92). Offered by Mr. and Mrs. Fortunato Porroto, Washington, D.C.

Oil, *Le Ravin de la Mort les Eparges*, by Joseph Victor Communal. Bequest of Frederick R. Wulsin through Lucien Wulsin, Jr., Co-executor of the estate.

Oil, *Self Portrait*, by Edmund C. Tarbell (1862-1938). Offered by Mrs. Josephine Tarbell Ferrell and Mrs. Mary Tarbell Schaffer.

Oil, *Mrs. Edmund C. Tarbell*, by Edmund C. Tarbell (1862-1938). Bequest of Mrs. Mercie Tarbell Clay.

An oil and 15 watercolors by William Henry Holmes (1846-1933), together with a watercolor by Kenneth C. Holmes. Offered by Anna Bartsch Dunn, Washington, D.C.: *Chestnut Trees in Bloom* (oil); *Field of Vari-colored Grasses*; *Flowery Meadow*; *Field of Wheat in Shock*; *Field of Jim Pie Weed*; *The Babbling Brook*; *The Open Sea*; *A Maryland Dirt Road*; *Field of Blossoms*; *In Holland*; *Royal Oak*; *Windmills*; *Michigan*; *Cherry Blossoms*; *Blossoms*; *On Sunset Hill*; and *Vase with Flower* by Kenneth C. Holmes.

A collection of 83 original sketches executed under the Work Projects Administration Program was accepted for its historical significance. The sketches were offered as a transfer from General Services Administration through the Internal Revenue Service and were represented by the following examples: *The Railroad Came to Town*, by Saul Berman (1899-); *Preliminary Study for Mural, Trinity, Texas, Post Office*, by Jerry Bywaters (1906-); *Deer and Buffalo Hunt*, by Woodrow Crumbo; *Tung Oil Industry*, by Xavier González (1898-); *Arrival of Colonel John Donaldson*, by F. Luis Mora (1874-); *Design for Mural for Post Office at Rockport, Massachusetts*, by William Lester Stevens, A.N.A. (1888-); and *Fruit Packing*, by Undetermined Artist.

A collection of 71 watercolors by Cass Gilbert, N.A. (1859-1934), was offered by Mrs. Walter A. Bastedo, New Canaan, Conn., through the U.S. National Museum, and was represented by five examples as follows: *Old House in Rouen*; *On the Canal, Bruges*; *Aqueduct*; *Battle Abbey*; *The Zwinger and Towers, Dresden*.

Three silhouettes by undetermined artists were acquired from Mrs. Helen Moffat Langdon, Alexandria, Va.: *Phoebe Cook DeWitt* (1736-1824); *Hannah DeWitt Shaw* (1758-1844); and *Abigail Shaw Barkley* (1792-1871).

The Commission recommended that the following be held for submission to the National Portrait Gallery Commission:

Ten oil portraits offered by the International Business Machines Corp., New York City, through T. D. Jones, director: *President James Abram Garfield* (1831-81), by Ole Peter Hansen Balling (1823-1906); *Fleet Admiral Ernest Joseph King* (1878-1956), by Albert K. Murray (1906-); *Admiral Marc Andrew Mitscher* (1887-1947), by Albert K. Murray (1906-); *Fleet Admiral Chester William Nimitz* (1885-), by Albert K. Murray (1906-); *Admiral William Frederick Halsey* (1882-1959), by Albert K. Murray (1906-); *Admiral Thomas C. Kincaid* (1888-), by Robert S. Sloan (1915-); *Secretary of State Cordell Hull* (1871-1955), by Camir Gregory Stapko (1913-) after Albert K. Murray (1906-); *Henry Clay* (1777-1852), by Undetermined Artist; *General Ulysses S. Grant* (1822-1885), by Samuel B. Waugh (1814-1885); and *General of the Army George Catlett Marshall* (1880-1959), by J. Anthony Wills.

Two oils, *Cass Gilbert* (1859-1934), by Ernest Ludwig Ipsen (1869-1951), and *Mrs. Cass Gilbert*, by Sir Arthur Stockdale Cope (1875-1940), offered by Mrs. Walter A. Bastedo, New Canaan, Conn., through the U.S. National Museum.

THE CATHERINE WALDEN MYER FUND

The following miniatures, watercolor on ivory, were acquired from the fund established through the bequest of Catherine Walden Myer:

No. 140. *Ebenezer Williams* (1769-), attributed to Rembrandt Peale (1778-1860).

No. 141. *Mrs. Ebenezer Williams, nee Martha Porter* (1774-), attributed to Rembrandt Peale (1778-1860).

Nos. 140 and 141 acquired from Lt. Col. W. C. Williams, Arlington, Va., through Miss Vera Fisher.

No. 142. *Gentleman*, by Peregrine F. Cooper (ac. 1840-90).

No. 143. *Gentleman*, by Undetermined Artist.

Nos. 142 and 143 acquired from Dorsey Griffith, New Market, Md.

No. 144. *Lady*, by A. G. Rose.

No. 145. *Gentleman*, by A. G. Rose.

Nos. 144 and 145 acquired from James Anton, Washington, D.C.

No. 146. *Gentleman*, attributed to Edward Greene Malbone (1777-1807).

No. 147. *J. G. E.*, by Rudolph Huber (1770-).

No. 148. *Gentleman* in the manner of John Smart (1740/1-1811).

Nos. 146-148 acquired from Ethel K. Perdriau, Berkeley, Calif.

No. 149. *A Pioneer Woman* by George Catlin (1796-1872). Acquired from Mr. David Silvette, Richmond, Va.

LOANS ACCEPTED

Two oils, *Portrait of Ruel P. Tolman* (1878-1954) by Bjorn Egeli (1900-) and *Portrait of Louis XVI* by Undetermined Artist, were lent by Mrs. Edward Kemper, Arlington, Va., October 18, 1962.

ART WORKS LENT AND RETURNED, PERMANENT COLLECTION

<i>Institutions</i>	<i>Loans</i>	<i>Loans returned</i>
American Federation of Arts.....	3	3
Bureau of the Budget.....	25	2
Defense, Department of.....	1	1
Durlacher Brothers, New York City.....	2	2
Federal Communications Commission.....	--	1
Health, Education, and Welfare, Department of.....	2	2
Huntington Galleries.....	1	1
Immaculate Heart of Mary Retreat House.....	1	1
Interior, Department of the.....	2	1
Internal Revenue Service.....	1	--
Joslyn Art Museum.....	1	--
Justice, Department of.....	1	--
Naval Historical Foundation.....	--	1
Post Office Department.....	--	4
President's Advisory Committee on Narcotic and Drug Abuse.....	6	--
President's Committee on Equal Employment.....	10	--
President's Committee on Intergovernmental Relations.....	12	--
Public Buildings Service.....	1	--
State, Department of.....	--	4
Treasury, Department of.....	1	1
Un-American Activities Committee.....	--	1
United Nations.....	1	--
University of California.....	4	4
U.S. District Court for the District of Columbia.....	3	2
U.S. Supreme Court.....	--	2
Veterans' Administration.....	--	2
Washington County Museum of Fine Arts.....	1	1
The White House (Food for Peace).....	3	--
Woodward & Lothrop.....	8	8
	90	44

SMITHSONIAN LENDING COLLECTION

The following were added to the lending collection December 4, 1962:

Oil, *Coming Storm*, by Ralph Iligan (1893-1960). Offered by Miss Agnes Iligan, East Elmhurst, N.Y.

Two oils, *Dordogne Valley* and *Dordogne Valley*, by William Didier-Pouget (1864-). Offered by Mrs. Lawrence S. Lesser, Chevy Chase, Md.

An oil, *Bigradoo*, by Owen J. Garde (1919-). Offered by Allan Gerda, New York City.

Harold F. Cross restored the following paintings: *Laura in Black Hat*, by Juliet Thompson (-1934); *Natalie*, by Juliet Thompson; *Reclining Model*, by Carrier-Belleuse (1824-87); together with the following by Alice Pike Barney (1860-1931): *Alice Roosevelt*; *Arcady*; *Lady with Fan*; *A. P. Barney*; and *Laura Alice Barney*.

Frames for the paintings *Reclining Model* by Carrier-Belleuse, *Laura in Black Hat* by Juliet Thompson, and *Lady with Fan* by Alice Pike Barney, were renovated by Istvan P. Pfeiffer.

ART WORKS LENT AND RETURNED, LENDING COLLECTION

<i>Institutions</i>	<i>Loans</i>	<i>Loans returned</i>
Barney, James Perrine.....	--	1
Barney Neighborhood House.....	9	--
Howard University.....	20	--
Justice, Department of.....	--	2
Lehigh University.....	--	1
Post Office Department.....	--	1
U.S. Senate.....	2	--
	—	—
	31	5

ALICE PIKE BARNEY MEMORIAL FUND

Additions to the principal during the year amounting to \$2,301.50 increased the total invested sums in the Alice Pike Barney Memorial Fund to \$45,424.49.

THE HENRY WARD RANGER FUND

According to a provision of the Henry Ward Ranger bequest, that paintings purchased by the Council of the National Academy of Design from the fund provided by the bequest and assigned to American art institutions may be claimed during the 5-year period beginning 10 years after the death of the artist represented, the following paintings were recalled for action of the Smithsonian Art Commission at its meeting December 4, 1962:

No. 44. *Their Son*, by Oscar Edward Berninghaus, A.N.A. (1874-1952), was returned to the Art Club of Erie, Erie, Pa., where it was originally assigned in 1924.

No. 45. *The Wood Cart*, by Louis Paul Dessar, N.A. (1867-1952), was returned to Yale University Art Gallery, New Haven, Conn., where it was originally assigned in 1925.

No. 123. *Gravel, Fish, and Soya Beans*, by Carl Frederick Gaertner, A.N.A. (1898-1952), assigned in 1948 to the Swope Art Gallery, Terre Haute, Ind., was accepted to become a permanent accession.

The following paintings purchased previously but not assigned have been allocated to the institutions indicated:

<i>Title and artist</i>	<i>Assignment</i>
249. <i>Reflections</i> , by Adolf Konrad (1915-)	Newark Museum, Newark, N.J.
258. <i>The Fascination of Toledo</i> , by Carol M. Grant (1930-)	Chattanooga Art Association, Chattanooga, Tenn.
261. <i>Turn Around</i> , by Ed Graves (1917-)	Reading Public Museum and Art Gallery, Reading, Pa.
263. <i>Monday Morning</i> , by Herb Olsen (1905-)	Springfield Art Association, Springfield, Ill.

The following paintings, purchased by the Council of the National Academy of Design since the last report, have been assigned as follows:

<i>Title and artist</i>	<i>Assignment</i>
265. <i>Dust to Dust</i> , by Robert Phillip Dayton (1895-)	Dayton Art Institute, Dayton, Ohio.
266. <i>From Breda</i> , by Xavier González (1898-)	Assignment pending.
267. <i>Young Guitarist</i> , by Leon Kroll (1884-)	The Berkshire Museum, Pittsfield, Mass.
268. <i>Low Tide</i> (watercolor), by William E. Preston (1930-)	Art Center in La Jolla, La Jolla, Calif.
269. <i>Ott Brenner's Barn</i> , by Robert Allan Gough (1931-)	Nebraska Art Association, Lincoln, Nebr.
270. <i>Conversation</i> , by John Koch (1909-)	Walker Art Museum, Bowdoin College, Brunswick, Maine.
271. <i>Grindstone Ledge</i> (watercolor), by Roy M. Mason (1886-)	Grand Rapids Art Gallery, Grand Rapids, Mich.
272. <i>Desolation</i> (watercolor), by D. Wu Ject-Key (1895-)	Assignment pending.
273. <i>Dilworthtown</i> (watercolor), by Philip Jamison (1925-)	Assignment pending.
274. <i>Sampans and Junks, Hong Kong</i> (watercolor), by Louis J. Kaep (1903-)	Assignment pending.
275. <i>Old Boat Yard</i> (watercolor), by Antonio P. Martino (1902-)	New Mexico State University, University Park, N. Mex.
276. <i>Off Season, St. Ives</i> (watercolor), by Tom Nicholas (1934-)	Georgia Museum of Art, University of Georgia, Athens, Ga.
277. <i>Autumn's Sentinels</i> (watercolor), by Robert H. Laessig (1913-)	Addison Gallery of American Art, Phillips Academy, Andover, Mass.

SMITHSONIAN TRAVELING EXHIBITION SERVICE

In addition to 102 exhibits held over from previous years as indicated below, 25 new shows were introduced. The total of 127 shows was circulated to 333 museums in the United States. Two exhibitions were delivered to the U.S. Information Service for circulation abroad.

EXHIBITS CONTINUED FROM PRIOR YEARS

- 1956-57: Japan II by Werner Bischof; and The World of Edward Weston.
- 1957-58: The American City in the 19th Century; Japanese Woodblock Prints; Theatrical Posters of the Gay Nineties; Burmese Embroideries; Japanese Dolls; Thai Painting; The Anatomy of Nature; and Drawings by European Children.
- 1958-59: Advertising in 19th Century America; Religious Subjects in Modern Graphic Arts; Our Town; Stone Rubbings from Angkor Wat; and Shaker Craftsmanship.

- 1959-60: Early Drawings of Toulouse-Lautrec; Watercolors and Drawings by Thomas Rowlandson; Prints and Drawings by Jacques Villon; American Prints Today; Brazilian Printmakers; Arts and Cultural Centers; Bernard Ralph Maybeck; Bazaar Paintings from Calcutta; Sardinian Crafts; Arctic Riviera; Photographs by Robert Capa I; Photographs by Robert Capa II; Pagan; Portraits of Greatness; Contrasts; Paintings by Young Africans; and Japan I.
- 1960-61: The Technique of Fresco Painting; Paintings by Ch'i Pai-Shih; Birds of Greenland; The America of Currier and Ives; Drawings by Sculptors; The Graphic Art of Edvard Munch; German Color Prints; Eskimo Graphic Art; Civil War Drawings I; Civil War Drawings II; American Art Nouveau Posters; American Industry in the 19th Century; America on Stone; Designed in Okinawa; Okinawa—Continuing Traditions; Prints by Munakata; Contemporary Japanese Drawings; Japan: by Werner Bischof; The Spirit of the Japanese Print; Americans—A View From the East; Swiss Industrial Architecture; Contemporary Swedish Architecture; Mies van der Rohe; Irish Architecture of the Georgian Period; One Hundred Years of Colorado Architecture; Brasilia—a New Capital; Design in Germany Today; Designed for Silver; Batiks by Maud Rydin; American Textiles; The Seasons, color photographs by Eliot Porter; The World of Werner Bischof; The Image of Physics; Charles Darwin: The Evolution of an Evolutionist; The Beginnings of Flight; The Magnificent Enterprise—Education Opens the Door; The New Theatre in Germany; Tropical Africa I; Tropical Africa II; Symphony in Color; Paintings and Pastels by Children of Tokyo; Children's Art from Italy; Hawaiian Children's Art; and Designs by Children of Ceylon.
- 1961-62: Tutankhamun's Treasures; Fourteen Americans in France; George Catlin, Paintings and Prints; Physics and Painting; UNESCO Watercolor Reproductions; Belgian Drawings; The Lithographs of Childe Hassam; Contemporary Italian Drawings; John Baptist Jackson; Contemporary Swedish Prints; Japanese Posters; The Face of Viet Nam; Architectural Photography (New Editions); Le Corbusier—Chapel at Ronchamp; The Family, The Neighborhood, The City; One Hundred Books from the Grabhorn Press; Wisconsin Designer-Craftsmen; Caribbean Journey; The Swedish Film; The Story of a Winery; This Is the American Earth; The Hidden World of Crystals; Hummingbirds; Brazilian Children's Art; Children Look at UNESCO; and My Friends.

EXHIBITIONS INITIATED IN 1963

Paintings and Sculpture

The Daniells in India.....	India Library, London, Mrs. Mildred Archer; P & O Lines.
Eskimo Carvings.....	Eskimo Art, Inc., Ann Arbor, Mich.; Canadian Embassy.
Holland: The New Generation.....	Municipal Museum of Amsterdam, W. J. H. B. Sandberg; The Embassy of the Netherlands.
John Sloan.....	Wilmington Society of the Fine Arts, Bruce St. John, Director.
Contemporary Japanese Sumi Paintings	Japan Society, New York; Kokusai Bunka Shinkokai, Tokyo.

Drawing and Prints

- American Prints Today, 1962----- Print Council of America, New York City.
- Contemporary American Drawings----- XXth American Drawing Annual, Norfolk; Addison Gallery of American Art, Bartlett Hayes.
- Work by Ernst Barlach----- German Barlach Society; Dr. Wolf Stubbe, Hamburger Kunsthalle.
- Old Master Drawings from Chatsworth----- Trustees of the Chatsworth Settlement; Devonshire Collection; Duke and Duchess of Devonshire; British Embassy.
- English Watercolors and Drawings----- Anonymous lender.
- Eskimo Graphic Art II----- Canadian Embassy; Eskimo Art, Inc., Ann Arbor, Mich., Eugene N. Power.
- European Posters----- Graphis Magazine, Zurich, Switzerland, Ken Baynes.

Oriental Art

- Pakistan Stone Rubbings----- Mrs. Ethel Jane Bunting, Washington, D.C.

Architecture

- Contemporary Canadian Architecture----- Royal Architectural Institute of Canada; Embassy of Canada.
- Twelve Churches----- California Redwood Association, San Francisco, Calif.
- 100 Sketches by Eric Mendelsohn----- Mrs. Louis Mendelsohn, San Francisco, Calif.
- Pre-Hispanic Mexico----- Mexican Government Tourist Office; Organization of American States, Washington, D.C.

Design and Crafts

- Today's American Wallcoverings----- American Institute of Interior Designers; Resources Council, New York City.
- Craftsmen of the City----- Irving Sloane, International Business Machines Corp.
- The Tradition of French Fabrics----- Brunshwig and Fils; French Embassy.

Children's Art

- A Child's World of Nature----- Junior School, School of the Art Institute of Chicago, Ill.
- West German Students' Art----- United States Committee for Refugees; Germany Indivisible; German Embassy.

History

Historic Annapolis.....	Historic Annapolis, Inc., Annapolis, Md.
Civil War Drawings III.....	American libraries; Library of Congress, Washington, D.C.
The Old Navy, 1776-1860.....	Franklin D. Roosevelt Library, Hyde Park, N.Y.; National Archives, Washington, D.C.

STAFF ACTIVITIES

Special services were performed under contracts with Keyes Porter and Delight Hall. Unfortunately, death prevented the completion of a study begun by the late George C. Groce, author.

Contracts were let for the relining and restoring by Harold F. Cross of the following:

Portrait of a Lady, by Abbott H. Thayer (1849-1921); *Her Leisure Hour*, by Irving Wiles (1861-1948); *John Tyler* (1790-1862), by G. P. A. Healy (1808-94); *Sundown*, by George Inness (1825-94); *Large Landscape*, by Thomas Barker (1769-1847); *Adoration of the Kings*, by Bernard Van Orley (1485/93-1542); *Lady in White (No. 1)*, by Thomas W. Dewing (1851-1938); *Lady in White (No. 2)*, by Thomas W. Dewing (1851-1938); *The Happy Mother*, by Max Bohm (1868-1923); *Cardinal*, by Titian (1477-1576); and *Mrs. Houston*, by Thomas W. Dewing (1851-1938).

Henri G. Courtais contracted for renovation of the following paintings:

Venetian Scene, by Francesco de Guardi (1712-93); *Windstorm*, by John Constable (1776-1837); *Portrait of Thomas Hopkinson* (1709-51), by Robert Feke (1705/24-1750/69); *The Great Western*, by William Marsh (ac. 1844-58); *Stephen Decatur* (1779-1820), attributed to Gilbert Stuart (1755-1828); *The Smoker*, by Eugene Delacroix (1798-1863); *Mrs. Robert Wetmore*, by Henry Inman (1802-46); *New Year's Shooter*, by George Luks (1867-1933); *Head of a Young Woman (Leonori)*, by James McNeill Whistler (1834-1903); *Water Carriers, Venice*, by Frank Duveneck (1848-1919); *John Gellatly* (1853-1931), by Irving R. Wiles (1861-1948); *The Sermon*, by Gari Melchers (1860-1932); and *The Holy Family, with St. Elizabeth*, by Peter Paul Rubens (1577-1640).

Nine original sketches executed under the Work Projects Administration were restored and remounted by Istvan P. Pfeiffer. Mr. Pfeiffer gilded frames for the following paintings: *Landscape with Figures*, by Thomas W. Dewing (1851-1938); *Lady in White (No. 1)*, by Thomas W. Dewing (1851-1938); and *Head of a Young Woman (Leonori)*, by James A. McNeill Whistler (1834-1903).

A physical inventory of paintings, sculptures, and prints accessioned by the National Collection of Fine Arts and a catalog listing of same were begun by staff members.

In addition to the approximately 20,500 requests for information received by mail and telephone, inquiries made in person at the office numbered 1,680. In all, 302 works of art were examined by the staff members.

Special catalogs were published for the following traveling exhibitions: Work by Ernst Barlach; Old Master Drawings from Chatsworth; and The Daniells in India. Folders announcing the following exhibits were also published: Pakistan Stone Rubbings; 100 Sketches by Eric Mendelsohn; History Exhibitions; Children's Art Exhibitions; Natural History and Science Exhibitions; Prints and Drawings Exhibitions; and Architectural Exhibitions.

Staff members served as jurors of a number of local art exhibitions and gave illustrated lectures to clubs.

As plans develop for the National Collection of Fine Arts' occupancy of the Civil Service Commission Building (the Old Patent Office), necessary additions are being made to staff. During the last year the following were named to the positions indicated: Donald R. McClelland, exhibits designer; Anne Castrodale, research assistant; Linwood Lucas, museum aide; and Nancy Brooks, clerk-stenographer.

SPECIAL EXHIBITIONS

July 8-September 3, 1962. A Centennial Exhibition of Paintings by Edmund C. Tarbell, N.A. (1862-1938), with the cooperation and assistance of Mrs. Josephine Tarbell Ferrell, Mrs. Mary Tarbell Schaffer, Mrs. John Staley, the Corcoran Gallery of Art, and the U.S. National Museum. The exhibition consisted of 26 paintings, 12 medals, and memorabilia.

September 15-October 11, 1962. Fifth Biennial Creative Crafts Exhibition, sponsored by The Kiln Club of Washington, D.C.; Ceramic Guild of Bethesda; Cherry Tree Textile Designers; Clay Pigeons Ceramic Workshop; Designers-Weavers; and Potomac Craftsmen. The exhibit contained 215 items including ceramics, textiles, weavings, enamels, sculpture, and jewelry. An illustrated catalog was privately printed.

September 17-November 11, 1962. Pre-Hispanic Mexico, sponsored by the Government of Mexico and the Pan American Union and circulated by the Smithsonian Institution Traveling Exhibition Service, was shown in the lobby of the Natural History Building. A brochure was privately printed.

October 20-November 8, 1962. The 69th Annual Exhibition of the Society of Washington Artists. The show consisted of 78 paintings and 23 sculptures. A catalog was privately printed.

November 17-December 9, 1962. The Art of Thailand, sponsored by the Ambassador of Thailand and the Washington-Bangkok Friendship Council, and with the cooperation of the Division of Ethnology, U.S. National Museum. The King's birthday was celebrated on December 5, 1962.

November 17-December 9, 1962. Contemporary Japanese Sumi Painting, organized by Kokusai Bunka Shinkokai, Tokyo, and circulated by the Smithsonian Institution Traveling Exhibition Service. The exhibition consisted of 30 paintings. An illustrated catalog was privately printed.

November 17-December 9, 1962. The Daniells in India [Thomas Daniell, R.A. (1749-1840), and William Daniell (1769-1837)], circulated by the Smithsonian Institution Traveling Exhibition Service. The show consisted of 50 watercolor paintings. An illustrated catalog was privately printed.

December 16, 1962-January 3, 1963. The 25th Metropolitan Art Exhibition sponsored by the American Art League. The exhibit consisted of 101 paintings and 12 sculptures. A catalog was privately printed.

January 12-February 3, 1963. European Posters, circulated by the Smithsonian Institution Traveling Exhibition Service. The show consisted of 39 posters by 19 artists. A catalog was privately printed.

January 12-February 3, 1963. 100 Books from the Grabhorn Press, circulated by the Smithsonian Institution Traveling Exhibition Service.

February 9-March 3, 1963. Eskimo Graphic Arts, circulated by the Smithsonian Institution Traveling Exhibition Service. The exhibit included 50 stone-block and sealskin prints.

February 9-March 3, 1963. Eskimo Carvings, circulated by the Smithsonian Institution Traveling Exhibition Service. The show consisted of 50 carvings in stone, bone, and ivory.

March 10-28, 1963. Contemporary German Books, sponsored by the Ambassador of Germany and the Boersenverein des Deutschen Buchhandels E.V. A catalog was privately printed.

April 7-25, 1963. The 66th Annual National Exhibition of the Washington Water Color Association. The exhibition consisted of 150 watercolors, prints, and drawings. An illustrated catalog was privately printed.

April 22-28, 1963. National Coin Week exhibition, sponsored by the Nation's Capital Coin Club.

May 5-24, 1963. The 30th Annual National Exhibition of the Miniature Painters, Sculptors, and Gravers Society of Washington, D.C. The exhibit consisted of 157 items including painting, sculpture, bookbinding, and graphics, and included a special showing of work of the founding members, Alyn Williams, Hattie E. Burdette, Benson B. Moore, Marian U. M. Lane, and Elizabeth Muhlhofer. An illustrated catalog was privately printed.

May 4-31, 1963. A Retrospective Exhibition of the work of John Sloan, organized by the Wilmington Society of the Fine Arts and circulated by the Smithsonian Institution Traveling Exhibition Service. The show included 37 paintings, 31 drawings, and 36 etchings. An illustrated catalog was privately printed.

June 8-30, 1963. The 1st National Exhibition of Art Directors sponsored by the Art Directors Club of Metropolitan Washington and the National Society of Art Directors. An illustrated catalog was privately printed.

Respectfully submitted.

THOMAS M. BEGGS, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the Freer Gallery of Art

SR: I have the honor to submit the 43d annual report on the Freer Gallery of Art, for the year ended June 30, 1963.

THE COLLECTIONS

Fifteen objects were added to the collections by purchase as follows:

PAINTINGS

- 62.26. Chinese, Ch'ing dynasty, by Wang Yüan-ch'i (1642-1715), dated 1704. Landscape in the manner of Ni Tsan. Ink and colors on paper. Two inscriptions and five seals of the artist on the painting. Kakemono: height: 0.955; width: 0.505.
- 62.29. Chinese, Ch'ing dynasty, by Wang Shih-min (1592-1680), dated 1670. Landscapes in old styles. Six paintings and one leaf of calligraphy, originally from an album. Ink and color on paper. Six inscriptions and 13 seals on paintings; 11 seals on leaf of calligraphy; colophon with one seal. Outside label inscribed. Handscroll: height: 0.318; length: 8.375. (Illustrated.)
- 62.27. Japanese, Edo period, Buddhist school. Scroll VII of the *Hoke Kyō* (Lotus Sutra). Gold with touches of color, on blue paper. Height: 0.280; width: 3.920.
- 62.28. Japanese, Ashikaga period, early 16th century, Muromachi-Suiboku school, by Shukō. Hawk. Ink on paper. Height: 0.959; width: 0.447.
- 62.30. Japanese, Momoyama period, Decorative school, by Nonomura Sōtatsu
- 62.31. (fl. ca. 1600-1630). Trees. A pair of six-fold screens. Ink and colors on gold leaf. Height: 1.540; width: 3.578. (62.30 illustrated.)
- 62.32. Turkish, Ottoman school, early 17th century. A young prince and attendant of which two hemistiches in *nasta'liq* are given above painting. Mounted as album leaf with marginal designs of gold cloud bands and floral rinceaux on dark ground. Miniature: height: 0.085; width: 0.060. Album leaf: height: 0.210; width: 0.125.

POTTERY

- 62.33. Chinese, T'ang dynasty, white ware. Wide shallow bowl with turned-over rim and flat, unglazed base. Clay: light buff stoneware. Glaze: opaque white with fine crackle. Decoration: none. Height: 0.092; diameter: 0.315.
- 62.34. Chinese, Ming dynasty, about 1400, celadon ware. Wide bowl with foliate rim; small foot; circular hole in base underneath. Clay: fine-grained high-fired gray porcelain. Glaze: transparent, thick, grayish-green celadon. Decoration: bowl sides fluted inside and out to match foliation of rim; molded ornamental lotus plaque applied in relief inside center covering hole in base. Height: 0.126; diameter: 0.326.

- 62.22. Japanese, Momoyama period (1574-1602), Shino ware (red). Shallow, almost flat, circular dish with slightly recessed foot. Clay: coarse light gray stoneware fired red on the surface. Glaze: milky, semi-opaque, bubbly, uneven. Decoration: bamboo sprays painted in black. Height: 0.022; diameter: 0.213.
- 62.23. Japanese, Edo period, Kakiemon ware. Dish with fluted rim; five spur marks on base. Clay: white porcelain. Glaze: transparent, slightly bluish. Decoration: Chinese scene of two figures in a garden by a house, in slip relief under the glaze. Inscriptions, rim decoration, and *fuku* mark on base in underglaze blue. Height: 0.054; diameter: 0.315.
- 62.24. Japanese, Momoyama period, Shino-Oribe ware. Dish with foliate rim, scalloped cavetto, and low foot-rim. Clay: coarse gray stoneware. Glaze: buff, semiopaque, bubbly, rough. Decoration: a very sketchy flower in brown in center. Height: 0.032; diameter: 0.191.
- 62.25. Japanese, Momoyama period, Shino ware. Dish with flaring foliate rim; knobs on sides; three loop feet. Clay: coarse gray stoneware. Glaze: grayish white; semiopaque; crackled; spur marks inside. Decoration: grasses in the center and a fence around cavetto painted in brown. Height: 0.053; diameter: 0.171.
- 63.1. Japanese, Edo period, Kutani ware, 17th century. Vase, pear-shaped; decorated with overglaze enamels, in red, yellow, and turquoise. Height: 0.256; diameter: 0.146. (Illustrated.)

WOOD SCULPTURE

- 62.21. Japanese, Fujiwara period, late 12th century. Miroku Bosatsu. Mandorla shows gilt design. Arms restored. With pedestal. Figure: height: 0.980; width: 0.750; depth: 0.508. Overall: height: 2.060; diameter: 1.140. (Illustrated.)

REPAIRS TO THE COLLECTION

Forty Chinese and Japanese paintings and one Persian manuscript were restored, repaired, or remounted by T. Sugiura, Oriental picture mounter. F. A. Haentschke, illustrator, remounted 47 Persian, Indian, and Arabic paintings. Repairs and regilding of three frames for American paintings were done outside the Gallery. Dr. F. Zach of Catholic University repaired and rebound one Indo-Persian manuscript.

CHANGES IN EXHIBITIONS

Changes in exhibitions amounted to 237, which were as follows:

American art: Prints -----	35	Japanese art:	
Chinese art:		Painting -----	7
Bronze -----	5	Pottery -----	3
Lacquer -----	2	Near Eastern art:	
Painting -----	49	Glass -----	67
Pottery -----	12	Metalwork -----	1
Glass -----	8	Painting -----	27
Christian art:		Pottery -----	5
Manuscripts -----	14		
Stone sculpture -----	2		

LIBRARY

The library is principally a place for the acquisition and conservation of books. But it is also intrinsically a place for browsing or study in fields of interest to the individual so that he may become a contemporary of all ages. During the year 909 acquisitions (other than slides) were added to the library; 263 of these were by purchase and 646 by exchange and gift. Outstanding gifts were: *Modern Japanese Prints*, by James Michener, the gift of Mr. and Mrs. Felix Juda; *Chinese Calligraphy and Paintings in the Collection of John M. Crawford*, the gift of James Cahill; 265 photographs for the study collection, the gift of Bungaku Kenkyusho of Japan. An outstanding purchase was *Hasshu gafu* (the book of painting of eight varieties), a Japanese edition using the woodblocks dated 1672.

The year's record of cataloging included a total of 1,507 entries, of which 697 analytics were made and 365 new titles of books, pamphlets, and scrolls were cataloged. Additions to the continuations of sets of books numbered 32, and 4,087 cards were added to the card catalog. Only 7 percent of these were available as printed cards from the Library of Congress; this indicates the amount of original cataloging in the library.

The slide collection has continued to grow. A checklist for slides of the Freer collection was instituted. Acquisition of 1,329 slides was completed, and 3,120 slides were bound and labeled. This last process included the classification for filing in the slide cabinets. A total of 5,989 slides were lent, of which 4,764 were for the use of staff members in their lectures.

There were 181 requests for bibliographic information by telephone and letters. In all, 766 scholars and students who were not members of the Freer staff used the library. Ten of these saw and studied the Washington Manuscripts, and three came to see the library installation.

The library's holdings of the Dewing letters were laminated by the Archival Restoration Associates, Inc., and it is hoped to have the Whistler letters laminated soon.

Hale Lancaster Darby served as volunteer for the intern program for the summer. This program is to interest young people in museology.

Two archival gifts of study material were transferred to the library during this past year. The Aga-Oglu archives have been arranged in a file cabinet, and the Herzfeld archives remain to be studied and put in order.

PUBLICATIONS

Five publications were issued by the Gallery as follows:

- Ancient glass in the Freer Gallery of Art*, by Richard Ettinghausen, 44 pp. with 99 illus., bibliography. (Smithsonian Institution Publication 4509.)
- Freer Gallery of Art*. Pamphlet containing a brief history of the Gallery and collections, 16 pp., 8 illus., 3 plans. (Smithsonian Institution Publication 4504.)
- Chinese Album Leaves*, by James Cahill, 40 pp. with 32 illus. and descriptions, frontispiece. (Smithsonian Institution Publication 4476.)
- The Field of Stones*, by Richard Edwards, xxi+131 pp., 50 pls., frontispiece. *Oriental Studies*, No. 5. (Smithsonian Institution Publication 4433.)
- The Whistler Peacock Room*, reprint ed. 1962, 22 pp., 9 illus., bibliography. (Smithsonian Institution Publication 4024, revised.)

Publications of staff members were as follows:

- CAHILL, JAMES F. Archibald G. Wenley, 1898-1962. *Artibus Asiae*, vol. 25 (1962), pp. 197-198.
- . Collecting paintings in China. *Arts Magazine*, vol. 37 (1963), pp. 66-72, illus.
- . Concerning the I-p' in style of painting, by S. Shimada. Translated by J. Cahill. *Oriental Art*, n.s., vol. 8, pp. 130-137, illus.
- . The Crawford collection; Chinese painting and calligraphy. *Oriental Art*, n.s., vol. 8 (1962), pp. 163-166, illus.
- . Some rocks in early Chinese painting. *Archives of the Chinese Art Society of America*, vol. 16 (1962), pp. 77-87, illus.
- ETTINGHAUSEN, RICHARD. A. G. Wenley (1898-1962). *Cosmos Club Bulletin*, vol. 16, No. 2 (February 1962), p. 204, portrait.
- . Arabische Malerei. Geneva, Skira, 1962.
- . An early Ottoman textile. First International Congress of Turkish Arts, Ankara, 1959. *Communications presented to the Congress*. Ankara, 1961, pp. 134-140, pls. 78-94.
- . Estetica. *Enciclopedia Universale dell'Arte*, vol. 5 (1962), cols. 94-95.
- . The evergreen tradition of Moslem art. *Art News*, vol. 61 (1963), No. 9, pp. 26-29, 55-56, illus. (part col.).
- . Genere e Profane Figurazioni: Oriente. *Enciclopedia Universale dell'Arte*, vol. 5 (1962), cols. 670-671.
- . Iconismo e Aniconismo: Islamismo. *Enciclopedia Universale dell'Arte*, vol. 7 (1962), cols. 156-158.
- . La Peinture Arabe. Geneva, Skira, 1962.
- . Turkey: ancient miniatures. Preface by R. Ettinghausen. Greenwich, Conn., New York Graphic Society, 1961. 26 pp., illus., 32 col. pls.
- . Turkish elements on silver objects of the Seljuk period of Iran. First International Congress of Turkish Arts, Ankara, 1959. *Communications presented to the Congress*, Ankara, 1961, pp. 128-133, 32 figs. on pls. 77-87.
- . Review of "A bibliography of the Architecture, Arts and Crafts of Islam to 1st Jan. 1960," by K. A. C. Creswell. *Journal of the American Oriental Society*, vol. 82 (1963), pp. 395-396.
- . Review of "Persian gardens and garden pavilions," by Donald N. Wilber. *The Middle East Journal*, vol. 16 (1962), pp. 546-547.
- . Review of "The Seljuks in Asia Minor," by Tamara Talbot Rice. *The Middle East Journal*, vol. 16 (1962), p. 390.

- GETTENS, R. J. Maya blue: an unsolved problem in ancient pigments. *American Antiquity*, vol. 27 (1962), pp. 557-564, tables.
- . Minerals in art and archeology. *Smithsonian Annual Report for 1961, 1962*, pp. 551-568, 8 pls.
- . Tumacacori interior decorations. In collaboration with Charles R. Steen. *Arizona, the Journal of Arizona History*, vol. 3 (1962), pp. 7-33, pls.
- POPE, JOHN A. A Chinese Buddhist pewter with a Ming date. *Archives of the Chinese Art Society of America*, vol. 16 (1962), pp. 88-91, illus.
- . Review of "Archaeology in China; vol. I. Prehistoric China," by Cheng Te-k'un. *Journal of the American Oriental Society*, vol. 80 (1960), pp. 82-85.
- . Review of "Chinese and Japanese Cloisonné Enamels," by Sir Harry Garner. *Oriental Art*, n.s., vol. 9 (1963), pp. 41-42.
- STERN, HAROLD P. The Perfumed Lady, by Moronobu. *Art Association of Indianapolis, Herron Museum of Art Bulletin*, vol. 49 (1962), pp. 4-8, illus.
- . Ukiyoe paintings of Tokugawa Japan. *Bulletin of the Japan Society, London*, vol. 3, No. 36 (1962), pp. 5-11.
- . Review of "The Folk Art of Japan," by Hugo Munsterberg. *Artibus Asiae*, vol. 25 (1962), pp. 213-214.
- . Review of "The Hokusai Sketchbook," by James A. Michener. *Artibus Asiae*, vol. 25 (1962), pp. 219-220.
- TROUSDALE, W. B. Architectural landscapes attributed to Chao Po-chü. *Ars Orientalis*, vol. 4 (1961), pp. 11-19, illus.
- . A Chinese handle-bearing mirror from Northern Afghanistan. *Artibus Asiae*, vol. 24 (1961), pp. 11-19, illus.
- WENLEY, ARCHIBALD G. A Chinese Sui dynasty mirror [with] "Note on the composition, fabrication and condition of this Sui dynasty mirror," by Rutherford J. Gettens. *Artibus Asiae*, vol. 25 (1962), pp. 141-148, plates.
- WEST, ELISABETH H. Jade; its character and occurrence. University Museum, University of Pennsylvania. *Expedition*, vol. 5 (1963), pp. 2-11, illus.
- . A ring-mount for micro-cross-sections of paint and other materials. *Studies in Conservation*, vol. 4 (1959), pp. 27-31, illus.

PHOTOGRAPHIC LABORATORY AND SALES DESK

The photographic laboratory made 15,453 items during the year as follows: 11,072 prints, 722 negatives, 3,415 color slides, 160 black-and-white slides, and 84 color sheet films. At the sales desk 56,574 items were sold, comprising 4,727 publications and 51,847 reproductions (including postcards, slides, photographs, reproductions in the round, etc.). These figures indicate a marked increase in the work of both the photographic laboratory and sales desk over that of previous years.

BUILDING AND GROUNDS

The exterior of the building appears to be sound. The roof was repaired but further repairs will be necessary. The sidewalk at the north front of the building was replaced. The cleaning of the exterior stonework is scheduled to commence in the new fiscal year.

In the interior, the structural steel in the attic is in need of painting. A fluorescent lighting system was installed over the galleries.

The attic heating system was altered by the installation of steam-heated units in the air ducts. Work continued on the maintenance of the bronze doors and fittings. The director's office was partitioned, and decoration, with the exception of the galleries, was carried out wherever necessary. Floor-level sills were installed throughout the ground level, and the vault was replastered and painted. Panel-case storage was expanded, and additional fire precautions were instituted with the extension of the spray booth and construction of a storage area in the subbasement for flammable materials. The areas in need of repair in the auditorium are being replastered.

The cabinet shop continued to make and repair furniture and equipment as the need arose.

Seasonal plantings in the courtyard flourished, and the brick walks which had deteriorated were replaced.

ATTENDANCE

The Gallery was open to the public from 9 to 4:30 every day except Christmas Day. The total number of visitors to enter the main entrance was 183,359. The highest monthly attendance was in August: 31,417.

There were 3,062 visitors who came to the Gallery office for various purposes—for general information, to submit objects for examination, to consult staff members, to take photographs or sketch in the galleries, to use the library, to examine objects in storage, etc.

AUDITORIUM

The series of illustrated lectures was continued as follows:

1962

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| October 16. | Dr. Michael Sullivan, University of London, England, "Realism in Chinese Art." Attendance, 181. |
| November 13. | Prof. Oleg Grabar, University of Michigan, "Medieval Jerusalem." Attendance, 212. |

1963

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| January 22. | Prof. Donald Keene, Columbia University, "Japanese Books and Their Illustrations." Attendance, 205. |
| February 12. | Prof. Pramod Chandra, University of Chicago, "Indian Painting of the Bundi School (17th and 18th Centuries)." Attendance, 64. |
| March 12. | Dr. John A. Pope, Freer Gallery of Art, "Chinese Collectors." Attendance, 200. |
| April 16. | Dr. James F. Cahill, Freer Gallery of Art, "Yüan Chiang and the Fantastic Landscape in China." Attendance, 203. |

The Smithsonian Institution used the auditorium as follows:

1962

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| July 17. | Museum Service. Lecture by Dr. Werner of the British Museum, "New Methods in Conservation." Attendance, 63. |
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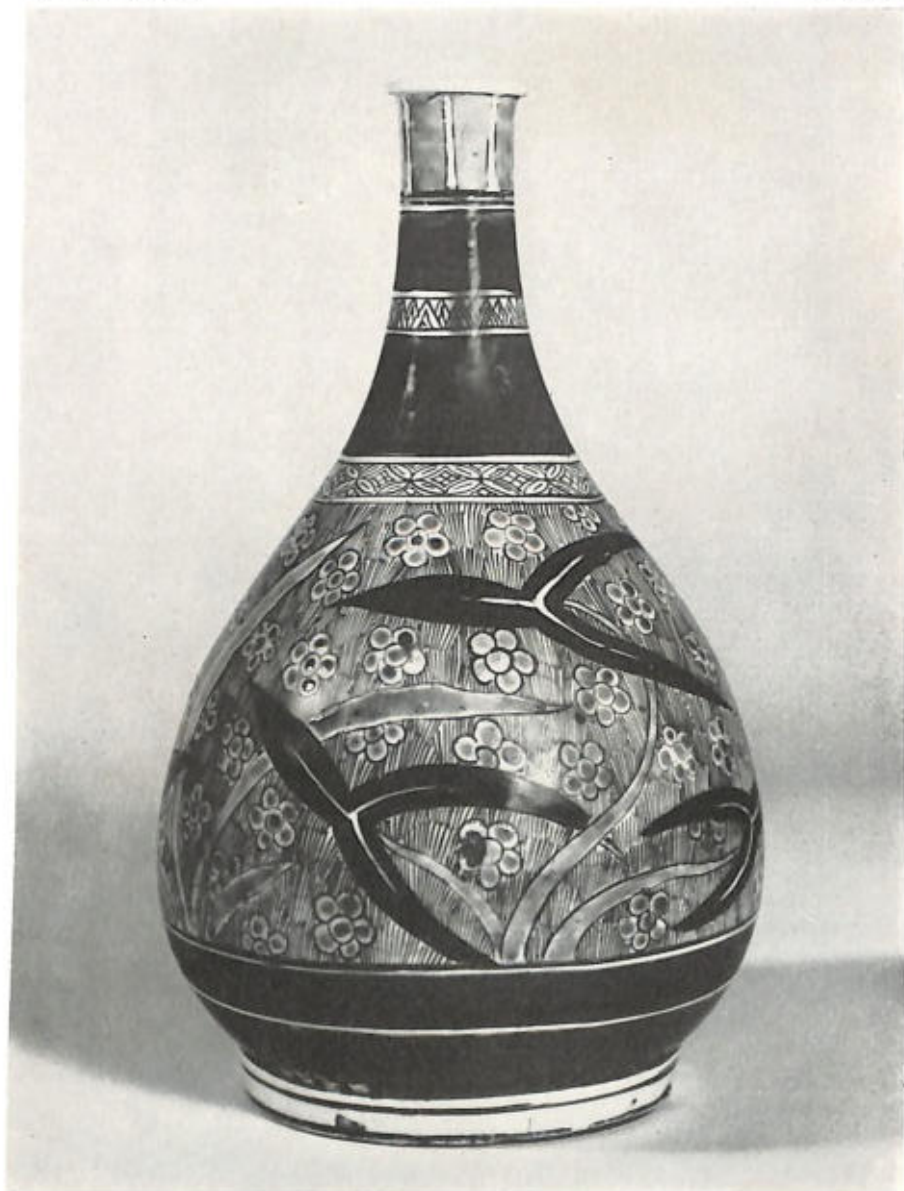
62.21. Japanese wood sculpture, Fujiwara period, late 12th century; Miroku Bosatsu.
Freer Gallery of Art.



62.29. Chinese painting, Ch'ing dynasty, by Wang Shih-min (1592-1680), dated 1670; landscape.
Freer Gallery of Art.



62.30. Japanese painting, Momoyama period, Decorative school, by Nonomura Sōtatsu (fl. ca. 1600-1630); trees. Freer Gallery of Art.



63.1. Japanese pottery, Edo period, Kutani ware, 17th century; vase. Freer Gallery of Art.

July 18.	Museum Service. Lecture by Dr. Werner, "Scientific Examination in Conservation." Attendance, 53.
July 20.	Museum Service. Public lecture by Dr. Werner, "The Scientific Examination of Paintings and Antiquities." Attendance, 170.
August 16.	Museum Service. Showing of the film, "The Salvage of the Warship <i>Vasa</i> ." For the Division of Naval History. Attendance, 151.
October 5.	National Air Museum conference. Attendance, 85.
November 13.	Committee on Oceanography conference. Attendance, 584. (Two sessions.)
1963	
April 24.	Museum Service. Lecture by Hugh Wakefield of the Victoria and Albert Museum, London, England, "English Victorian Glass." Attendance, 97.

Throughout the year, outside organizations used the auditorium as follows:

Washington Film Society, 15 times. Total attendance, 3,206.
U.S. Department of Agriculture, 34 times. Total attendance, 4,846.
U.S. Department of Health, Education, and Welfare, 13 times. Total attendance, 1,416.
The Peace Corps, once. Attendance, 151.
The Women's Committee of the National Symphony Orchestra, once. Attendance, 112.
The Washington Center for Metropolitan Studies and the Washington Art Council, once. Attendance, 121.
The Archaeological Institute of America, twice. Total attendance, 335.
Fashion Group, Inc., 5 times. Total attendance, 821.

STAFF ACTIVITIES

The work of the staff members has been devoted to the study of new accessions, of objects contemplated for purchase, and of objects submitted for examination, as well as to individual research projects in the fields represented by the collection of Chinese, Japanese, Persian, Arabic, and Indian materials. In all, 6,984 objects and 1,130 photographs were examined, and 451 Oriental language inscriptions were translated for outside individuals and institutions. By request, 29 groups totaling 786 persons met in the exhibition galleries for docent service by the staff members. Fourteen groups totaling 141 persons were given docent service by staff members in the storage rooms.

Among the visitors were 118 distinguished foreign scholars or persons holding official positions in their own countries who came here under the auspices of the Department of State to study museum administration and practices in this country.

During the year the technical laboratory examined the following objects by various methods, including microscopic and microchemical,

X-ray diffraction, ultraviolet light, spectrochemical analysis, and specific gravity determination:

Freer objects examined.....	195
Outside objects examined.....	53

These include 52 objects cleaned and/or repaired; 19 inquiries were answered by letter.

The following projects were undertaken by the laboratory during the year:

1. For 6 weeks in October and December 1962, Miss E. West worked at the Conservation Center of the Institute of Fine Arts, New York University, where she continued spectrochemical analyses of Chinese bronzes from the Freer Collection.
2. Continued analyses by wet chemical methods of Chinese bronzes in the Freer Collection.
3. Continued systematic collection of data on technology of ancient copper and bronze in the Far East.
4. Continued studies on corrosion products of ancient metal objects.
5. Continued editorship of *IIC Abstracts* published by the International Institute for Conservation of Historic and Artistic Works, London, England.

By invitation, the following lectures were given outside the Gallery by staff members (illustrated unless otherwise noted):

1962

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| July 13. | Dr. Ettinghausen, at the International Glass Congress, Washington, D.C., "Ancient Glass in the Freer Gallery of Art." Attendance, 45. |
| September 13. | Mr. Gettens, at a symposium on archeological chemistry, American Chemical Society, Atlantic City, N. J., "Composition of Ancient Chinese Bronze Ceremonial Vessels." Attendance, 35. |
| October 11. | Dr. Pope, at the Royal Ontario Museum, Toronto, Canada, "Chinese Export Porcelain." Attendance, 400. |
| October 12. | Dr. Pope, at the University of Toronto, Toronto, Canada, "The Civilization of Angkor." Attendance, 40. |
| October 22. | Dr. Cahill, at Connecticut College, New London, Conn., "The Contemporary Relevance of Chinese Painting." Attendance, 130. |
| October 23. | Dr. Cahill, at Yale University, New Haven, Conn., "Subject and Expression in Chinese Painting." Attendance, 80. |
| October 23. | Dr. Ettinghausen, at the Lions Club, Vienna, Va., "Travels in the East." Attendance, 140. |
| October 24. | Dr. Cahill, at the Pierpont Morgan Library, New York City, "Subject and Expression in Chinese and Recent Western Painting." Attendance, 300. |
| October 26. | Dr. Ettinghausen, at the Baltimore Museum of Art, Baltimore, Md., "Treasures from the Near East in the Freer Gallery of Art." Attendance, 360. |
| October 30. | Dr. Pope, at the Pierpont Morgan Library, "Chinese Collectors." Attendance, 190. |

1962

- November 12. Dr. Cahill, at the University of Kansas, Lawrence, Kans., "Confucian Humanism and Chinese Art." Attendance, 75.
- November 13. Dr. Cahill, at the University of Kansas, "The Contemporary Relevance of Chinese Painting." Attendance, 250.
- November 14. Dr. Cahill, at the University of Kansas, "Subject and Expression in Chinese Painting." Attendance, 60.
- November 14. Mr. Gettens, at the American Chemical Society, Stamford, Conn., "Minerals in Art and Archeology." Attendance, 50.
- November 15. Dr. Ettinghausen, at the Hermitage Foundation, Norfolk, Va., "Persian Paintings." Attendance (lecture given twice), 65 and 75; total attendance, 140.
- November 19. Dr. Stern, at the Pierpont Morgan Library, "The Chinese Influences in Japanese Painting." Attendance, 320.
- December 4. Dr. Ettinghausen, at the Metropolitan Museum of Art, New York City, "Connoisseurship in Islamic Art." Attendance, 10.
- December 20. Dr. Ettinghausen, at Asia House, New York City, "Formalism and Realism in Persian Painting." Attendance, 325.

1963

- January 8. Dr. Cahill, at the State University of Iowa, Iowa City, "Yüan Dynasty Painting" and "The Contemporary Relevance of Chinese Painting." Attendance, respectively, 12 and 350.
- January 10. Dr. Cahill, at the College of St. Theresa, Winona, Minn., "Values in Chinese Painting." Attendance (lecture given twice), 400 and 350; total attendance, 750. Also, "The Philosophical Background on Chinese Landscape Paintings." Attendance, 15.
- January 11. Dr. Cahill, at the College of St. Theresa, "Forms and Materials of Oriental Painting" and "The Contemporary Relevance of Chinese Painting." Attendance, respectively, 20 and 400.
- January 16. Dr. Ettinghausen, at St. Margaret's Episcopal Church, Washington, D.C., "Islamic Art." Attendance, 48.
- January 23. Dr. Pope, at the annual dinner meeting of the Board of Regents of the Smithsonian Institution, "Freer Gallery Research Project on Ancient Chinese Ceremonial Bronzes."
- February 12. Mr. Gettens, at the Marshall Laboratory of E. I. du Pont de Nemours & Co., Philadelphia, Pa., "The Blue Pigments of Antiquity." Attendance, 75.
- February 13. Dr. Pope, at the Japan Society, New York City, "Japanese Porcelain and the Dutch Trade." Attendance, 150.
- March 13. Dr. Cahill, at the Fogg Art Museum, Harvard University, Cambridge, Mass., "The Contemporary Relevance of Chinese Painting." Attendance, 150.
- March 13. Dr. Pope, at the National Society of the Colonial Dames of America, Washington, D.C., "Chinese Blue-and-white." Attendance, 60.

1963

- March 20. Dr. Stern, at the Philadelphia Museum of Art, Philadelphia, Pa., "Popular Painting of Tokugawa Japan." Attendance (lecture given twice), 55 and 200; total attendance, 255.
- April 4. Dr. Stern, at the Seattle Art Museum, Seattle, Wash., "Popular Painting of Tokugawa Japan." Attendance, 100.
- April 8. Dr. Stern, at the M. H. DeYoung Memorial Museum, San Francisco, Calif., "Popular Painting of Tokugawa Japan." Attendance, 150.
- April 18. Dr. Stern, at the Dickson Art Center, Los Angeles, Calif., "Hokusai." Attendance (lecture given twice), 200 and 150; total attendance, 350.
- April 18. Mr. Gettens, at the Conservation Center, New York University, New York City, "Corrosion of Ancient Copper and Bronze Metal Objects." Attendance, 12.
- April 18. Dr. Ettinghausen, at Southern Illinois University, Carbondale, Ill., "Old and New Testament Subjects in Islamic Art." Attendance, 95.
- April 19. Dr. Stern, at the Japan Society of Southern California, Los Angeles, "Popular Painting of Tokugawa Japan." Attendance, 250.
- April 19. Dr. Ettinghausen, at Southern Illinois University, "Idealism and Reality in Persian Miniatures." Attendance, 55.
- April 22. Dr. Ettinghausen, at the University of Michigan, Ann Arbor, Mich., "Miniatures of the Safavid Period" and "Unpublished Persian Miniatures of the Mongol Period." Attendance, respectively, 16 and 16.
- April 25. Dr. Stern, at the Chicago Art Institute, Chicago, Ill., "Popular Painting of Tokugawa Japan." Attendance, 75.
- April 26. Dr. Stern, at the University of Chicago, "Hokusai." Attendance, 100.
- May 3. Dr. Cahill, at the National League of American Pen Women, Washington, D.C., "Literary Artists of China." Attendance, 30.
- May 8. Mr. Trousdale, at the University of Michigan, Ann Arbor, Mich., "Central Asian Painting—Part I." Attendance, 16.
- May 10. Mr. Trousdale, at the University of Michigan, "Central Asia Painting—Part II." Attendance, 16.
- May 17. Dr. Pope, at the National Museum, Stockholm, Sweden, "History of the Early Trade in Chinese Porcelain." Attendance, 200.
- May 20. Dr. Stern, at the Cosmos Club, Washington, D.C., "Popular Painting of Tokugawa Japan." Attendance, 250.
- June 6. Miss E. H. West, at the annual meeting of the International Institute for Conservation—American Group, Institute of Fine Arts, New York University, "The Alteration of Early Chinese Jades." Attendance, 75.
- June 9. Dr. Stern, at the National Gallery of Art, Washington, D.C., "Innovations in Japanese Art." Attendance, 250.

Members of the staff traveled outside Washington on official business as follows:

1962

- July 13. Dr. Stern, in New York City, met with representatives of Shorewood Press to discuss reproductions of Freer Gallery objects to be used in a forthcoming book on drawings. Examined objects at various dealers.
- July 16. Dr. Ettinghausen, in Corning, N.Y., attended meetings of the Sixth International Congress on Glass at the Corning Glass Center.
- July 20. Dr. Ettinghausen, in New York City, examined objects at several dealers.
- August 3-5. Dr. Stern, in New York City, attended a meeting at the Japan Society re: Restorer Training Program. Met with a representative of Shorewood Press to discuss overruns, prints, and quality control of reproductions of Freer objects. Attended the exhibition of Rockefeller porcelains at the Metropolitan Museum of Art.
- August 8. Miss E. H. West, in Philadelphia, Pa., visited the University Museum where she examined jades in the collection and helped plan a jade exhibition to be shown during the winter.
- August 10-11. Dr. Stern, in New York City, attended a meeting at Asia House re: Japanese Government Loan Exhibition (1965). Met with Prof. Donald Keene of Columbia University regarding his lecture to be given at the Freer Gallery in January 1963.
- August 13-14. Dr. Cahill, in Toronto, Canada, visited the Royal Ontario Museum, where he examined objects in storage and in a private collection.
- August 24. Mr. Gettens, at the Walters Art Gallery, Baltimore, Md., examined miscellaneous objects for the purpose of making a selection for color photography.
- September 7-9. Dr. Cahill, in New York City, attended the Rockefeller exhibition of Chinese porcelains and the Fabergé collection at the Metropolitan Museum of Art. Also examined Far Eastern objects at several dealers.
- September 12-14. Mr. Gettens and Miss E. H. West, at Atlantic City, N.J., attended a symposium on Archeological Chemistry sponsored by the American Chemical Society.
- September 25. Dr. Ettinghausen, in Winchester, Va., examined objects in a private collection.
- September 26. Dr. Pope, at the Baltimore Museum of Art, examined objects offered to the Museum.
- October 2-5. Dr. Cahill, at the Pierpont Morgan Library in New York City, attended the opening of the exhibition of John M. Crawford, Jr.'s collection of Chinese paintings. Served as chairman of a conference on Chinese painting held at Asia House. Attended a lecture by Dr. Michael Sullivan at the Institute of Fine Arts, New York University. Examined objects which were to be auctioned at the Parke-Bernet Galleries.

1962

- October 11-14. Dr. Pope, in Toronto, Canada, examined Chinese porcelains at the Royal Ontario Museum, and in several private collections.
- October 12-14. Mr. Gettens, in Toronto, Canada, visited the Royal Ontario Museum, where he made a technical examination of a number of objects and conferred with staff members.
- October 17-18. Dr. Cahill, in New York City, attended a lecture by Prof. Max Loehr of the Fogg Art Museum at the Pierpont Morgan Library.
- October 17-20. Dr. Stern, in New York City, saw the Crawford collection at the Pierpont Morgan Library. Discussed publication problems with representatives of Shorewood Press. Discussed the Restorer Program with Mrs. John D. Rockefeller III, Douglas Overton, and Kojiro Tomita. Examined a newly damaged Chinese painting at Rockefeller Center. Examined numerous objects at several dealers.
- October 26-
December 4. Miss E. H. West conducted research at the Conservation Center, Institute of Fine Arts, New York University, New York City.
- November 8-9. Dr. Ettinghausen, in New York City, examined numerous objects at the Metropolitan Museum of Art. Assisted in giving a doctoral examination at Columbia University.
- November 9-16. Dr. Cahill, at the University of Kansas, Lawrence, Kans., gave seven informal talks to classes, and an interview on the university radio station. In Kansas City, Mo., examined the Nü Wa Chai collection of Chinese paintings at the William Rockhill Nelson Gallery of Art and also examined a number of Far Eastern objects at the University of Kansas Art Museum.
- November 13-15. Mr. Gettens, in New York City, visited the Kapp & Strobel Ivory Works and the New York University Conservation Center. In Stamford, Conn., attended a meeting of the Western Connecticut Section of the American Chemical Society. In Philadelphia, visited the University Museum to study sculpture in connection with his study of "Minerals in Art and Archeology."
- November 15-16. Dr. Ettinghausen, in Norfolk, Va., examined objects at the Norfolk Museum, and visited the Hermitage Foundation.
- November 17-20. Dr. Stern, in New York City, met with Prof. Donald Keene of Columbia University concerning the latter's forthcoming lecture at the Freer Gallery. Examined numerous objects at several dealers.
- November 18-21. Dr. Ettinghausen, in Cambridge, Mass., examined objects at the Fogg Art Museum, and in several private collections. In Dublin, N.H., examined the Ray Winfield Smith collection of Near Eastern glass.
- November 29-30. Mr. Gettens, in Philadelphia, attended the opening of the Chinese Jade Exhibition at the University Museum. Examined objects at the Philadelphia Museum of Art, where he also took samples from several pewter objects.
- December 4. Mr. Gettens and Mr. Schwartz, at the Walters Art Gallery, examined and photographed numerous objects.

1962

- December 2-5. Dr. Pope, with Dr. Osvald Sirén of Stockholm, Sweden, went to Mount Kisco, N.Y., to examine objects in the collection of Mrs. Eugene Meyer. In New York City, examined numerous objects at several dealers.
- December 4-6. Dr. Ettinghausen, in New York City, assisted in giving a doctoral examination at Columbia University and examined objects at several dealers. In Philadelphia, visited with Prof. S. D. Goitein at the University of Pennsylvania.
- December 12-13. William B. Trousdale, at the University Museum in Philadelphia, examined objects in the Chinese Jade Exhibition.
- December 12-14. Dr. Cahill, in Philadelphia, visited the Chinese Jade Exhibition at the University Museum. In New York City, attended the opening of the exhibition of Persian Painting at Asia House and examined objects at several dealers.
- December 26. Dr. Ettinghausen, in Baltimore, attended a luncheon meeting at the Walters Art Gallery.
- December 31. Dr. Stern, in New York City, examined numerous objects at several dealers.

1963

- January 9. Dr. Cahill, in Minneapolis, Minn., examined Chinese objects in the Minneapolis Institute of Art.
- January 12. Dr. Cahill, in Chicago, saw the Chinese exhibitions at the Field Museum of Natural History and examined various Chinese and Japanese objects at the Art Institute of Chicago.
- January 23-24. Mr. Trousdale, at the University Museum in Philadelphia, arranged for the photographing of Chinese jades selected from the current exhibition, for a review to appear in *Oriental Art*.
- January 24-25. Dr. Pope, in Baltimore, attended a meeting of the board of directors, and the annual meeting of the College Art Association.
- January 24-25. Dr. Ettinghausen, in Baltimore, attended the annual meeting of the College Art Association.
- February 1. Martin P. Amt returned to a dealer in New York City two objects that had been under consideration at the Freer Gallery of Art.
- February 1-2. Mr. Gettens, in New York City, attended a symposium on "Teaching Microscopy" under the auspices of the New York Microscopical Society at the American Museum of Natural History. Examined objects at the Metropolitan Museum of Art, and at a dealer.
- February 1-2. Dr. Ettinghausen, in New York City, attended the exhibition of Persian Painting at Asia House and examined objects at several dealers.
- February 1-4. Dr. Pope, in New York City, served as chairman of A.C.L.S.-S.S.R.C. Joint Committee for Grants on Asia and examined objects at a dealer.
- February 4. Mr. Trousdale, at the University Museum in Philadelphia, measured and oversaw the photographing of Chinese jades for a review of the exhibition for *Oriental Art*.

1963

- February 4. Miss E. H. West, at the University Museum in Philadelphia, examined and took samples from objects in the Chinese Jade Exhibition.
- February 14-15. Dr. Pope, in New York City, examined objects at several dealers. In New Haven, Conn., examined Chinese objects at the Yale University Art Gallery and, in Middletown, Conn., a large number of Japanese *tsuba* at the Davidson Art Center, Wesleyan University.
- February 15-16. Dr. Ettinghausen, in New York City, examined Near Eastern objects at several dealers.
- February 20-23. Dr. Stern, in New York City, attended the opening of the Tea Taste in Japanese Art Exhibition at Asia House. Examined numerous objects belonging to several dealers and one private collector.
- February 26-27. Dr. Pope, at the Cleveland Museum of Art, Cleveland, Ohio, examined numerous objects and photographs.
- March 1. Dr. Ettinghausen, in New York City, examined objects at several dealers and one private collector.
- March 14. Dr. Cahill, in New York City, examined objects at several dealers, and attended the Tea Taste in Japanese Art Exhibition at Asia House.
- March 14-15. Dr. Pope, in New York City, attended the Tea Taste in Japanese Art Exhibition at Asia House and examined objects at several dealers.
- March 16. Dr. Ettinghausen, in New York City, examined objects at several dealers.
- March 20. Dr. Stern, at the Philadelphia Museum of Art, examined numerous Far Eastern objects.
- March 26. Dr. Pope, in Philadelphia, attended the Founders' luncheon meeting of the Association for Asian Studies.
- March 26. Dr. Stern, in New York City, discussed publishing problems with representatives of Shorewood Press.
- March 29. Dr. Ettinghausen, in New York City, examined objects at several dealers.
- March 29-May 6. Dr. Stern, in Seattle, Wash., visited the Seattle Art Museum, where he studied the Far Eastern collection. In San Francisco, Calif., studied the collections at the M. H. DeYoung Memorial Museum, and examined objects for several individual collectors. In Los Angeles, Calif., studied the collections at the Los Angeles County Museum, and examined objects for several individual collectors. In Kansas City, Mo., examined Japanese objects at the William Rockhill Nelson Gallery of Art, and for an individual collector. In Chicago, Ill., visited the Art Institute of Chicago to see the exhibitions and study Japanese objects in storage. In Cleveland, Ohio, visited the Cleveland Museum of Art to see the exhibitions and study Japanese and Chinese objects in the collection, and examined objects in a private collection. In New York City, met with the publisher of Shorewood Press and examined objects at a dealer.

1963

- April 18. Mr. Gettens, in New York City, examined objects at the Metropolitan Museum of Art and at one dealer.
- April 23. Dr. Ettinghausen, at the Cleveland Museum of Art, examined Sasanian silver and Indian miniatures.
- April 27. Dr. Ettinghausen, in New York City, examined Persian and Sasanian objects at several dealers.
- April 29. Dr. Pope left to attend the opening of the Museum of Far Eastern Antiquities in Stockholm, Sweden, and to study collections elsewhere in Europe; to return in July.
- May 10-11. Dr. Ettinghausen, in New York City, met with Mr. N. Pevsner, publisher of the Pelican History of Art, and examined objects at several dealers.
- May 22-24. Mrs. L. O. West and Mrs. M. H. Quail attended the annual meeting of the Museum Stores Association at the Minneapolis Institute of Arts and the Walker Art Center, Minneapolis, Minn.
- June 5-12. Mr. Gettens, in New York City, attended meetings of the American Group of the International Institute for Conservation of Museum Objects at the Institute of Fine Arts, New York University. He also attended a meeting of the Board of Consulting Fellows of the New York University Conservation Center. Visited the New York Public Library for reference material, and the American Museum of Natural History in search of minerals in art. Examined a number of photographs of ancient Chinese bronzes belonging to the Royal Ontario Museum and examined several objects at a dealer in order to acquire pigment samples.
- June 6-7. Miss E. H. West, in New York City, attended the annual meetings of the American Group of the International Institute for Conservation of Museum Objects at the Institute of Fine Arts, New York University.
- June 13-14. Dr. Stern, in New York City, attended the Buddha Image Exhibition at Asia House, met with a representative of McGraw-Hill Book Co., Inc., concerning publication problems, and examined numerous objects at several dealers.
- June 17. Mr. Trousdale left for the Far East and Europe to give lectures and do research. He will return in October.

As in former years, members of the staff undertook a wide variety of peripheral duties outside the Gallery, served on committees, held honorary posts, and received recognitions.

Respectfully submitted.

JOHN A. POPE, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the National Gallery of Art

SIR: I have the honor to submit, on behalf of the Board of Trustees, the 26th annual report of the National Gallery of Art, for the fiscal year ended June 30, 1963. This report is made pursuant to the provisions of section 5(d) of Public Resolution No. 14, 75th Congress, 1st session, approved March 24, 1937 (50 Stat. 51).

ORGANIZATION

The statutory members of the Board of Trustees of the National Gallery of Art are the Chief Justice of the United States, the Secretary of State, the Secretary of the Treasury, and the Secretary of the Smithsonian Institution, ex officio. The three general trustees continuing in office during the fiscal year ended June 30, 1963, were Paul Mellon, John Hay Whitney, and John N. Irwin II. Chester Dale, who had been a general trustee since 1943 and president since 1955, died on December 16, 1962. Rush H. Kress, who had been a general trustee since 1955, died on March 22, 1963. On January 25, 1963, Paul Mellon was elected by the Board of Trustees to serve as president of the Gallery and John Hay Whitney was elected vice president.

The executive officers of the Gallery as of June 30, 1963, were as follows:

Earl Warren, Chief Justice of the United States, Chairman.	John Walker, Director.
Paul Mellon, President.	Ernest R. Feidler, Administrator.
John Hay Whitney, Vice President.	Huntington Cairns, General Counsel.
Huntington Cairns, Secretary-Treasurer.	Perry B. Cott, Chief Curator.

The three standing committees of the Board, as constituted at the annual meeting on May 2, 1963, were as follows:

EXECUTIVE COMMITTEE

Chief Justice of the United States, Earl Warren, Chairman.	John Hay Whitney.
Paul Mellon, Vice Chairman.	John N. Irwin II.
Secretary of the Smithsonian Institution, Leonard Carmichael.	

FINANCE COMMITTEE

Secretary of the Treasury, C. Douglas Dillon, Chairman.	John Hay Whitney.
Paul Mellon.	John N. Irwin II.
Secretary of the Smithsonian Institution, Leonard Carmichael.	

ACQUISITIONS COMMITTEE

Paul Mellon, Chairman.
John Hay Whitney.

John N. Irwin II.
John Walker.

PERSONNEL

At the close of fiscal year 1963, full-time Government employees on the staff of the National Gallery of Art numbered 301. The U.S. Civil Service regulations govern the appointment of employees paid from appropriated public funds.

Continued emphasis was given to the training of employees under the Government Employees Training Act.

APPROPRIATIONS

For the fiscal year ended June 30, 1963, the Congress of the United States in the regular annual appropriation and a supplemental appropriation required for pay increases under Public Law 87-793, approved October 11, 1962, provided \$2,113,850 to be used for salaries and expenses in the operation and upkeep of the National Gallery of Art, the protection and care of works of art acquired by the Board of Trustees, and all administrative expenses incident thereto, as authorized by joint resolution of Congress approved March 24, 1937 (20 U.S.C. 71-75, 50 Stat. 51).

The following expenditures and encumbrances were incurred:

Personnel compensation and benefits.....	\$1,760,670.00
All other items.....	350,099.34
Unobligated balance.....	3,080.66
Total.....	<u>2,113,850.00</u>

ATTENDANCE

There were 1,793,500 visitors to the Gallery during the fiscal year 1963, an increase of 460,994 over the total attendance of 1,332,506 reported for fiscal year 1962. The daily average number of visitors was 4,941. This increase was in large measure due to the exhibition, for a period of 27 days, of the *Mona Lisa* by Leonardo da Vinci. During that period 518,525 persons viewed the painting and total attendance was 673,872.

ACCESSIONS

There were 1,206 accessions by the National Gallery of Art as gifts, loans, or deposits during the fiscal year.

GIFTS

During the year the following gifts or bequests were accepted by the Board of Trustees:

PAINTINGS

<i>Donor</i>	<i>Artist</i>	<i>Title</i>
George Mathew Adams, New York, N.Y.	Legros.....	Hempstead Heath.
Do.....	---do.....	A Lady with a White Collar and Cap.
Mrs. Mellon Bruce, New York, N.Y.	Orazio Gentileschi..	The Lute Player.
Miss Alice Dodge, Wash- ington, D.C.	Inness.....	Lake Albano, Sunset.
Mrs. Peter H. B. Freling- huysen, Convent Station, N.J.	Goya.....	The Bookseller.
Do.....	---do.....	Duke of Wellington.
Mrs. Olga Roosevelt Graves, Washington, D.C.	Sargent.....	Miss Grace Woodhouse.
National Gallery of Art Purchase Fund, Andrew W. Mellon Gift.	Joos van Cleve.....	Joris W. Vezeler.
Do.....	---do.....	Margaretha Boghe, Wife of Joris W. Vezeler.

SCULPTURE

Frederick C. Oechsner, Washington, D.C.	German School, 20th Century.....	Death Mask of Ernst Bar- lach.
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GRAPHIC ARTS

George Matthew Adams, New York, N.Y.	Legros.....	Three drawings and 22 prints.
The Ford Foundation, New York, N.Y.	Cusumano.....	Picnic on the Beach.
Mrs. James McBey, London, England.	James McBey.....	Eleven etchings.
Frederick C. Oechsner, Washington, D.C.	Kollwitz.....	Riot.
Lessing J. Rosenwald, Jenkintown, Pa.	Altdorfer.....	The Beautiful Virgin of Ratisbon.
Do.....	van Meckenem.....	The Nativity.
William H. Schab, New York, N.Y.	Swiss, 15th Century Woodcut.	The Crucifixion with the Virgin and St. John.
W. G. Wendell, Hartford, Conn.	Stow Wengenroth..	Jacob Wendell House, Ports- mouth, N.H.
Do.....	---do.....	Warner House, Portsmouth, N. H.

OTHER GIFTS

In the fiscal year 1963 gifts of money were made by the Old Dominion Foundation, the A. W. Mellon Educational and Charitable Trust, Avalon Foundation, Calouste Gulbenkian Foundation, Andre

Meyer, Mr. and Mrs. Howard Jensen, the Washington Post Co., and the Eugene and Agnes Meyer Foundation. An additional distribution was received from the estate of William Nelson Cromwell.

Mrs. Mellon Bruce gave money and securities to establish the Ailsa Mellon Bruce Fund to be used by the Trustees for the purchase of works of art for the National Gallery of Art and for educational purposes related to works of art.

WORKS OF ART ON LOAN

The following works of art were received on loan by the Gallery:

<i>From</i>	<i>Artist</i>	<i>Title</i>
Chester Dale, New York, N.Y.	Bellows.....	Blue Morning.
Do.....	Monet.....	The Seine at Giverny.
Mrs. Charles R. Henschel, New York, N.Y.	do.....	Still Life: Game.
Mr. and Mrs. David Lloyd Kreeger, Washington, D.C.	Bonnard.....	Le Jardin de Bosquet.
Do.....	Van Gogh.....	Vase of Flowers.
Do.....	Monet.....	Varengville.
Do.....	Picasso.....	Café de la Rotonde.
Do.....	Redon.....	Au Fond de la Mer.
Do.....	Renoir.....	Bather.
Mrs. Eugene E. Meyer, Washington, D.C.	Dufresne.....	Still Life.
Do.....	Renoir.....	Nude.
Do.....	do.....	Man Lying on a Sofa.

WORKS OF ART ON LOAN RETURNED

The following works of art on loan were returned during the fiscal year:

<i>To</i>	<i>Artist</i>	<i>Title</i>
Trustees for Harvard Uni- versity (Robert Woods Bliss Collection), Wash- ington, D.C.	547 objects of Pre-Colum- bian art.
Mrs. Charles R. Henschel, New York, N.Y.	Monet.....	Still Life: Game.
Mr. and Mrs. David Lloyd Kreeger, Washington, D.C.	Bonnard.....	Le Jardin de Bosquet.
Do.....	Van Gogh.....	Vase of Flowers.
Do.....	Monet.....	Varengville.
Do.....	Picasso.....	Café de la Rotonde.
Do.....	Redon.....	Au Fond de la Mer.
Do.....	Renoir.....	Bather.
Mrs. Eugene E. Meyer, Washington, D.C.	Dufresne.....	Still Life.
Do.....	Renoir.....	Nude.
Do.....	do.....	Man Lying on a Sofa.

WORKS OF ART LENT

The American Federation of Arts, New York, N.Y., circulated the following works of art during the fiscal year to the Municipal Art Gallery, Los Angeles, Calif.; M. H. De Young Memorial Museum, San Francisco, Calif.; Atlanta Art Association, Ga.; Virginia Museum of Fine Arts, Richmond; Cincinnati Art Museum, Ohio; Carnegie Institute, Pittsburgh, Pa., and the Dallas Museum of Fine Arts, Texas:

<i>To</i>	<i>Artist</i>	<i>Title</i>
American Federation of Arts, New York, N.Y.	Joseph Badger.....	Mrs. Isaac Foster.
Do.....	John Bradley.....	Little Girl in Lavender.
Do.....	Bundy.....	Vermont Lawyer.
Do.....	Earl.....	Family Portrait.
Do.....	Hofmann.....	Berks County Almshouse.
Do.....	Linton Park.....	Flax Scutching Bee.
Do.....	Susanne Walters.....	Memorial to Nicholas M. S. Catlin.
Do.....	Unknown.....	Jonathan Benham.
Do.....	do.....	The Start of the Hunt.
Do.....	do.....	The End of the Hunt.
Do.....	do.....	The Sargent Family.
Do.....	do.....	Alice Slade.
Do.....	do.....	Joseph Slade.
Do.....	do.....	General Washington on White Charger.
Do.....	do.....	Blue Eyes.
Do.....	do.....	The Hobby Horse.
Do.....	do.....	Mahantango Valley Farm.
Do.....	do.....	Civil War Battle Scene.
Abby Aldrich Rockefeller Folk Art Collection, Williamsburg, Va.	Field.....	Ark of the Covenant.
Colby College, Waterville, Maine.	Unknown.....	Burning of Old South Church, Bath, Maine.
The Jewish Museum, New York, N.Y.	C. E. B.....	Moses Rescued from the Bulrushes.
North Carolina Museum of Art, Raleigh, N.C.	British School.....	Pocahontas.
Do.....	Peale.....	General William Moultrie.
Do.....	Stuart.....	Mrs. Richard Yates.
Do.....	Theus.....	Isaac Motte.
Oklahoma Art Center, Oklahoma City, Okla.	Healy.....	Daniel Webster.
Do.....	Henri.....	Catherine.
Do.....	Ryder.....	Mending the Harness.
Do.....	Sargent.....	Repose.
Do.....	Stuart.....	George Washington.
Do.....	Sully.....	Andrew Jackson.
Do.....	Zeliff.....	The Barnyard.

To	Artist	Title
Storm King Art Center, Mountainville, N.Y.	Homer.....	Hound and Hunter.
Historical Society of Talbot County, Md.	Unknown.....	At the Writing Table.
Do.....	do.....	Boy in Blue Coat.
Do.....	do.....	Burning of Old South Church, Bath, Maine.
Do.....	do.....	Civil War Battle Scene.
Do.....	do.....	Columbia.
Do.....	do.....	Mount Vernon.
Do.....	do.....	The Trotter.
Do.....	do.....	Twenty-two Houses and a Church.
Do.....	do.....	Village by the River.
Do.....	do.....	"We go for the Union."
Do.....	Hofmann.....	View of Benjamin Reber's Farm.
Do.....	Johnston.....	The Westwood Children.
Virginia Museum of Fine Arts, Richmond, Va.	Toole.....	Skating Scene.
Washington County Mu- seum of Fine Arts, Hagerstown, Md.	Healy.....	Abraham Lincoln.
The White House, Wash- ington, D.C.	Lamb.....	"Emancipation Proclama- tion."
Woodlawn Plantation, Mount Vernon, Va.	Polk.....	Washington at the Battle of Princeton.

EXHIBITIONS

The following exhibitions were held at the National Gallery of Art during the fiscal year 1963:

- Exhibition of the Collection of Mr. and Mrs. Andre Meyer.* Continued from previous fiscal year through July 8, 1962.
- Prints with Color.* From the Rosenwald Collection. Continued from previous fiscal year through August 23, 1962.
- Lithographs by George Bellows.* From the Mellon, Rosenwald, and Addie Burr Clark Memorial collections. Continued from previous fiscal year through October 16, 1962.
- Water Colors by Winslow Homer from the Collection of Mrs. Charles R. Henschel.* July 6 through September 12, 1962.
- Etchings and Lithographs by Edouard Manet.* From the Rosenwald Collection. August 24 through December 13, 1962.
- A General Selection of Material from the Index of American Design.* September 21, 1962, to continue into the next fiscal year.
- American Prints Today-1962.* Sponsored by the Print Council of America. September 23 through October 14, 1962.
- Drawings from the National Gallery of Art collections.* October 27, 1962, through March 17, 1963.
- Etchings by G. B. Tiepolo, G. D. Tiepolo, and Canaletto.* From the Rosenwald Collection. October 27, 1962, through June 11, 1963.
- Old Master Drawings from Chatsworth.* From the Devonshire Collection. October 28 through November 25, 1962.

- A Selection of Christmas Prints.* From the National Gallery of Art collections. December 14, 1962, through February 26, 1963.
- John Gadsby Chapman, A Retrospective Exhibition.* From 21 public collections and private lenders. December 16, 1962, through January 13, 1963.
- Mona Lisa* by Leonardo da Vinci. Lent to the President of the United States and the American people by the Government of the French Republic. January 8 through February 3, 1963.
- Jacques Callot: A Selection of Prints from the Collections of Rudolf L. Baumfeld and Lessing J. Rosenwald.* February 3 through March 17, 1963.
- Hercules and the Hydra and Hercules and Antaeus* by Antonio del Pollaiuolo. Lent by the Republic of Italy. February 4 through February 10, 1963.
- Industry and Ingenuity.* From the Index of American Design. February 27 through May 2, 1963.
- Landscape Prints.* From the Rosenwald Collection. May 2, 1963, to continue into the next fiscal year.
- Prints and Drawings by Mary Cassatt.* From the Rosenwald Collection. June 13, 1963, to continue into the next fiscal year.
- Exhibitions of recent accessions.* "Oysters" by Manet, continued from previous fiscal year through August 9, 1962; "Street in Venice" by Sargent, August 10 through September 13, 1962; "Duke of Wellington" by Goya, November 19 through December 27, 1962; "The Lute Player" by Gentileschi, April 5 through May 13, 1963; "Joris W. Vezeler" and "Margaretha Boghe, Wife of Joris W. Vezeler" by Joos van Cleve, June 21, 1963, to continue into the next fiscal year.

TRAVELING EXHIBITIONS

Special exhibitions of graphic arts from the National Gallery of Art collections were circulated during the fiscal year to 29 museums, universities, schools, and art centers in the United States and abroad.

Index of American Design.—Forty-eight exhibitions (2,104 plates) of material from the Index were circulated to 18 States, the District of Columbia, and to Bath, England.

CURATORIAL ACTIVITIES

Under the direction of Dr. Perry B. Cott, chief curator, the curatorial department accessioned 53 gifts to the Gallery during the fiscal year 1963. Advice was given with respect to 1,716 works of art brought to the Gallery for expert opinion and 25 visits to collections were made by members of the staff in connection with offers of gifts. About 4,350 inquiries, many of them requiring research, were answered verbally and by letter.

Dr. Hereward Lester Cooke, curator of painting, acted as consultant to National Aeronautics and Space Administration with duties of organizing and supervising commissions to artists for paintings of themes relating to the space program.

Dr. Katharine Shepard, assistant curator of graphic arts, gave a graduate course in "Ancient Sculpture" the first semester and a graduate course in "Ancient Painting" the second semester, at Catholic University, during the past academic year.



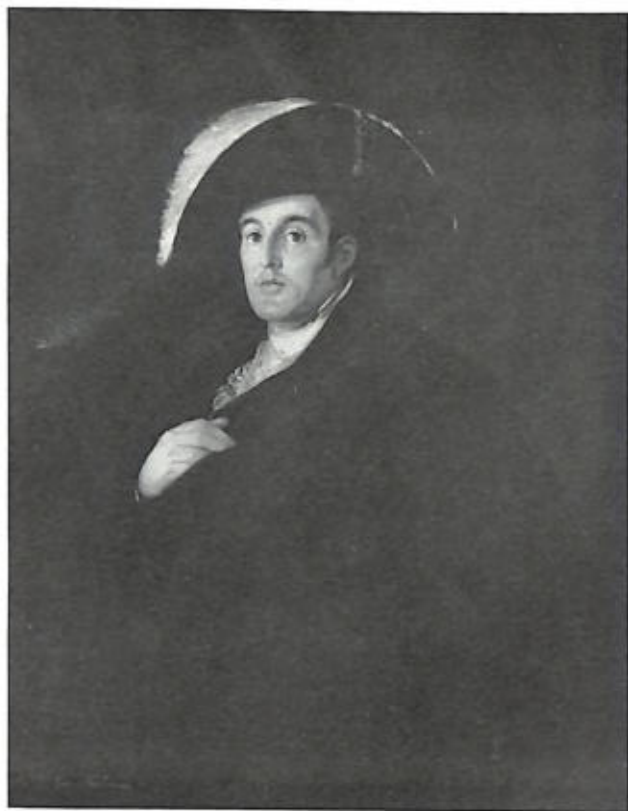
Joos van Cleve: Joris W. Vezeler. National Gallery of Art Purchase Fund, Andrew W. Mellon Gift.



Joos van Cleve: Margaretha Boghe, Wife of Joris W. Vezeler. National Gallery of Art Purchase Fund, Andrew W. Mellon Gift.



Goya: The Bookseller. National Gallery of Art. Gift of Mrs. P. H. B. Frelinghuysen.



Goya: The Duke of Wellington. National Gallery of Art. Gift of Mrs. P. H. B. Frelinghuysen.



Gentileschi: The Lute Player. National Gallery of Art. Gift of Mrs. Mellon Bruce.

The Richter Archives received and cataloged over 133 photographs on exchange from museums here and abroad; 987 photographs were purchased and about 1,000 reproductions have been added to the archives. The Iconographical Index was increased by 500 photographs.

RESTORATION

Francis Sullivan, resident restorer of the Gallery, made regular and systematic inspection of all works of art in the Gallery and on loan to Government buildings in Washington, and periodically removed dust and bloom as required. He relined, cleaned, and restored 11 paintings and gave special treatment to 29. Twenty-seven paintings were X-rayed as an aid in research. Experiments were continued with synthetic materials suggested by the National Gallery of Art Fellowship at the Mellon Institute of Industrial Research, Pittsburgh, Pa. Technical advice on the conservation of paintings was furnished to the public upon request. Special treatment was given to works of art belonging to Government agencies, including the U.S. Capitol, Treasury, Supreme Court, Army Medical Museum, and General Services Administration. In other instances advice was furnished the various agencies concerning the care and conservation of paintings.

Mr. Sullivan made trips to various cities in connection with the loan of paintings to the Gallery for special exhibitions. He also made a trip to Los Angeles as a special representative of the Department of Justice in connection with the recovery of two paintings belonging to the Uffizi Gallery, Florence, Italy.

PUBLICATIONS

Dr. Cott wrote the foreword to the *National Gallery of Art and its Collections*, a booklet reproducing 40 paintings in the Gallery's collections.

William P. Campbell, assistant chief curator, wrote the catalogs for the Winslow Homer Water Color exhibition from the collection of Mrs. Charles R. Henschel and the John Gadsby Chapman exhibition.

Dr. Cooke wrote an article for the *National Geographic Magazine*, September 1962 issue, entitled "Early America as Seen by Her Native Artists" based on the collection of Edgar W. and Bernice Chrysler Garbisch. He also wrote the text for 16 National Gallery leaflets.

Mrs. Mary Elizabeth C. Burnet, museum curator, assisted in the preparation of the catalogs of the Winslow Homer Water Color exhibition and the John Gadsby Chapman exhibition. She also worked on the proposed Check List of American Paintings in the National Gallery of Art.

PUBLICATIONS FUND

During the fiscal year 1963 the Publications Fund placed on sale four new books: *Treasures from the National Gallery of Art*, edited by Huntington Cairns and John Walker, the third in a series of large books containing 85 color reproductions of paintings in the National Gallery of Art collection; *The Eternal Present: The Beginnings of Art* by Sigfried Giedion, the A. W. Mellon Lecturer in the Fine Arts for 1957; *Prints* compiled by Carl Zigrosser, with an introduction by Lessing J. Rosenwald; and *One Hundred and One Masterpieces of American Primitive Painting*, with preface by John Walker. An English translation of Dr. Perry B. Cott's section on the National Gallery of Art in *Paintings of the World's Great Galleries* was made available, together with five new catalogs of temporary exhibitions: *Water Colors by Winslow Homer from the Collection of Mrs. Charles R. Henschel*; *American Prints Today, 1962*; *Old Master Drawings from Chatsworth*; *John Gadsby Chapman—American Painter and Illustrator*; and *Jacques Callot—A Selection of Prints from the Collections of Rudolf L. Baumfeld and Lessing J. Rosenwald*.

In addition to 6 new colotype reproductions of paintings by Inness, Renoir, Bellotto, Vlaminck, and Feti, the Publications Fund introduced 40 color reproductions in a new format, 19 by 25 inches in size. Thirty-seven new postcards and 44 new 11- by 14-inch subjects were published, bringing the total subjects available in these formats to 152 and 201, respectively.

EDUCATIONAL PROGRAM

The program of the Educational Department was carried out under the direction of Dr. Raymond S. Stites and his staff. The staff lectured and conducted tours on works of art in the Gallery's collections.

Attendance for the general tours, tours of the week, and picture-of-the-week talks amounted to 38,846. The attendance at the Sunday afternoon lectures in the auditorium totaled 14,209.

Special tours, lectures, and conferences were arranged for a total of 16,567 persons. These special appointments were made for Government agency groups, and at the request of congressional offices, for educators, foreign students, club and study groups, religious organizations, conventions, and women's organizations. These special services were also given to school groups from many parts of the country.

The program of training volunteer docents continued and special instruction was given to approximately 130 volunteers from the Junior League of Washington and the American Association of University Women. By special arrangement with the public and parochial

schools of the District of Columbia and surrounding counties of Maryland and Virginia, these volunteers conducted tours for 66,528 children, representing an increase over last year of 7,279. The volunteers also guided 663 Safety Patrol girls on tours of the Gallery and special tours were given for 25,445 children who came to see the *Mona Lisa* while it was on exhibition at the Gallery. Altogether, 92,636 children benefited from the services of the volunteer docents.

Fifty-two lectures were given in the auditorium on Sunday afternoons. Of these, 22 were delivered by members of the staff of the National Gallery and 24 by guest lecturers. John Pope-Hennessy delivered the 12th Annual Series of the A. W. Mellon Lectures in the Fine Arts on six consecutive Sundays on "The Artist and the Individual: Some Aspects of the Portrait."

The slide library of the Educational Department has a total of 45,682 slides in its permanent and lending collections. During the year 1,408 slides were added to the collections. Altogether, 397 persons borrowed 11,964 slides from the collections. It is estimated that the slides were seen by 24,840 viewers. The Carnegie Slides, a group of 2,500 on American art, which are in the Educational Department slide library, were borrowed by 45 persons.

Members of the staff participated in outside activities delivering lectures and papers, and conducting meetings. One staff member taught a course at a local university. Staff members prepared material for the school tour program and the slide lending program, and prepared scripts for the Lectour recordings. Thirty-five radio talks were prepared, recorded, and broadcast on station WGMS.

A printed calendar of events was prepared and distributed monthly to a mailing list of more than 8,300 names, an increase of 1,000 names over last year's mailing list.

EXTENSION SERVICES

The Office of Extension Services, under the direction of the curator of the Index of American Design, Dr. Grose Evans, circulates to the public traveling exhibits, films, slide lectures, and filmstrip sets of works of art in the National Gallery of Art's collections. There are 27 traveling exhibits in circulation lent free of charge except for shipping expenses. These were circulated in 262 bookings and were seen by an estimated 131,000 viewers. The Extension Service circulated 33 framed collotype exhibits among the public schools of the District of Columbia and the general public. Two additional exhibits were prepared, and the Traveling Exhibition Service of the Smithsonian Institution circulated one to 14 borrowers. The other was prepared at the request of Senator Pell of Rhode Island and was shown in 18

Rhode Island cities and towns. Two films on the National Gallery of Art were circulated in 152 bookings and were seen by approximately 45,600 viewers. A total of 1,065 slide-lecture sets were circulated in 2,749 bookings and were seen by approximately 164,940 viewers. The Extension Service reached approximately 384,560 persons during the year; this is an increase of 143,710 over the number of persons served last year.

LIBRARY

During the year the library, under the supervision of Miss Ruth E. Carlson, accessioned 4,852 publications, of which 4,640 were obtained through exchange, by gift, or purchased from private funds. Government funds were used to purchase 19 books and 24 subscriptions to periodicals, and for the binding of 169 volumes of periodicals. A total of 1,610 photographs were added to the library's stock and were acquired by exchange or purchased from private funds.

During the year 2,475 publications were cataloged and classified, 8,568 cards were filed, and 2,609 periodicals were recorded. Library of Congress cards were used for 657 titles; original cataloging was done for 483 titles; and 18 cards were sent to the Union Catalog, Library of Congress. There were 11,455 periodicals circulated, and 5,353 charged out to the staff. There were 6,082 books shelved in routine work. The library borrowed 1,363 books and 1 microfilm on inter-library loan.

The exchange program was continued during the year and 1,130 National Gallery publications were distributed in accordance with this arrangement. The Gallery received 2,251 publications of various types under the program.

The library is the depository for black-and-white photographs of works of art in the Gallery's collections. These are maintained for use in research by the staff, for exchange with other institutions, for reproduction in approved publications, and for sale to the public. Approximately 6,129 photographs were stocked in the library during the year and 1,310 orders for 7,607 photographs were filled. There were 386 permits for reproduction of 919 subjects processed in the library.

INDEX OF AMERICAN DESIGN

The Index of American Design, under the supervision of Dr. Grose Evans, circulated 116 sets of color slides (5,698) throughout the country; and 232 photographs of Index materials were used for exhibits, study, and publication. The photographic file has been increased by 82 negatives and 83 prints. Twenty-five permits to reproduce 117 subjects from the Index were used. Special exhibits of Index material were prepared at the request of various groups, in-

cluding the U.S. Department of Labor. Ten exhibits were refurbished and three sets of slide notes were rewritten.

The material of the Index was studied during the year by 502 visitors conducting research, collecting material for publication and design, and gathering illustrations for publications.

The curator of the Index held conferences with important scholars, attended meetings, lectured on American folk art to USIA personnel and three other groups, and conducted tours for several foreign visitors interested in Index material.

MAINTENANCE OF THE BUILDING AND GROUNDS

The Gallery building, mechanical equipment, and grounds have been maintained throughout the year at the established standards.

Replacement of the sidewalk on the Mall side of the building, between Fourth Street and Seventh Street, was accomplished under a contract let by the National Park Service, Department of the Interior.

The Gallery entered into contracts for the conversion of a passenger elevator from manual to automatic operation and for the complete renovation of the skylight on the west wing of the building. Work under these contracts will be completed during the next fiscal year. The passenger elevator conversion will complete the program of converting all such elevators to automatic control.

Storm windows were installed at the windows in the Print Storage Room to eliminate the condensation which formed on the inside of the windows during cold weather. This treatment is planned for all other windows in the building as funds become available.

The Gallery greenhouse continued to produce flowering and foliage plants in quantities sufficient for all decorative needs of special openings and day-to-day requirements of the Garden Courts.

LECTOUR

During the fiscal year 1963 Lectour, the Gallery's electronic guide system, was used by 66,321 visitors. This reduction in the use of the system as compared with fiscal year 1962 is largely due to the fact that it was not feasible to operate the system during the 27 days of the *Mona Lisa* exhibition.

Lobby D, the room in which recent acquisitions are exhibited, was wired for Lectour by the Gallery staff; Lectour talks can now be provided for all new acquisitions.

OTHER ACTIVITIES

Forty Sunday evening Calouste Gulbenkian Foundation concerts were given during the year in the East Garden Court. The National Gallery of Art Orchestra, conducted by Richard Bales, played eight

of these concerts. Two concerts were made possible in part by a grant from the Music Performance Trust Fund of the American Federation of Musicians. The National Gallery Strings, conducted by Mr. Bales, furnished music during the openings of two Gallery exhibitions during the year. The concert on Sunday evening, October 21, 1962, was dedicated to United Nations Day. Six Sunday evenings, from April 28 to June 2, were devoted to the Gallery's 20th American Music Festival. All concerts were broadcast in their entirety by radio station WGMS-AM and FM. Washington music critics continued their coverage of these concerts. During the intermissions of the concerts, talks were delivered by members of the staff of the Educational Department on art topics, and by Mr. Bales on the musical programs of the evening. The Gallery orchestra, conducted by Mr. Bales, played two concerts at Hammond High School in Alexandria, Va. Four 1-hour long concerts were taped by the National Gallery orchestra, Mr. Bales conducting, and were televised on WTOP-TV. Paintings from the Gallery's collections were featured. Mr. Bales spoke to three groups on music, and was commissioned by the Gregorian Institute of America to write six piano pieces entitled "Holiday at the White House." The National Gallery orchestra and Mr. Bales received a citation from the American Association of University Women for the cultural and educational contribution made to the community by their television programs.

In response to requests, 54,489 copies of "An Invitation to the National Gallery of Art" and 1,602 information booklets were distributed to Congressmen and various organizations holding conventions in Washington.

Henry B. Beville, head of the photographic laboratory, and his assistants, processed 20,347 items including negatives, prints, slides, color transparencies, and color separations.

A total of 200 permits were issued to persons to copy works of art, and 169 permits to photograph were issued.

AUDIT OF PRIVATE FUNDS OF THE GALLERY

An audit of the private funds of the Gallery will be made for the fiscal year ended June 30, 1963, by Price Waterhouse and Co., public accountants. A report of the audit will be forwarded to the Gallery.

Respectfully submitted.

HUNTINGTON CAIRNS, *Secretary.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the Canal Zone Biological Area

SIR: It gives me pleasure to present herewith the annual report on the Canal Zone Biological Area for the fiscal year ended June 30, 1963.

SCIENTISTS, STUDENTS, AND OBSERVERS

Following is the list of 87 scientists, students, and observers who made use of the Canal Zone Biological Area facilities on the mainland, and/or visited Barro Colorado Island last year and stayed for several days in order to conduct scientific research or observe the wildlife of the area. In addition, scientists of other research and technical organizations in the Canal Zone and the Republic of Panama made use of station facilities.

<i>Name</i>	<i>Principal interest</i>
Akre, Mr. and Mrs. Roger D., Kansas State University.	Myrmecophiles associated with army ants.
Anderson, William, Gridley, Calif.	Ornithology.
Andrews, H. T., Washington University.	Botany.
Ayensu, Edward S., Smithsonian Institution.	Botany.
Barghoorn, Dr. and Mrs. Elso S., Harvard University.	Limnology.
Barth, Dr. Robert, Harvard University.	Behavior and physiology of cockroaches.
Bennett, Dr. and Mrs. Charles, Jr., University of California.	Ecology and microclimatology.
Bishop, Alison, Cornell University.	Behavior of primates.
Blake, Doris H., Smithsonian Institution.	Entomology.
Blest, Dr. Andrew David, University College, London.	Behavior of Lepidoptera.
Brown, Floyd, Washington University.	Behavior and ecology of amphibians and reptiles.
Brown, Dr. William L., Cornell University.	Behavior and ecology of ants.
Chapin, Dr. and Mrs. James P., American Museum of Natural History.	Ornithology.
Cochran, Dr. Doris, Smithsonian Institution.	Herpetology.

<i>Name</i>	<i>Principal interest</i>
Collier, Dr. George, San Diego State College.	Behavior and ecology of jaçanas.
Covich, Alan, Washington University.	Botany.
Dressler, Dr. Robert L., Washington University.	Botany.
Duellman, Dr. William E., University of Kansas.	Herpetology.
Eisenmann, Dr. Eugene, New York, N.Y.	Ornithology.
Eisendrath, Mrs. Erna, Washington University.	Botany.
Elofson, Dr. Olaf, Sundsvall, Sweden.	Observation of wildlife.
Eyde, Dr. Richard H., Smithsonian Institution.	Botany.
Fisher, Dr. and Mrs. Kenneth B., West Covina, Calif.	Observation of wildlife.
Flinn, Michael, Inst. of Laryngology and Otology, London.	Study of bats and acoustic organs of various neotropical animals.
Greenwell, Frank, Smithsonian Institution.	Assistant to Dr. Handley.
Handley, Dr. Charles, Smithsonian Institution.	Mammals.
Harty, Dr. Stephen T., Mount Holly, N.J.	Ornithology.
Heatwole, Dr. Harold, University of Puerto Rico.	Behavior and ecology of amphibians, reptiles, and arachnids.
Hecht, Dr. Max K., Queens College, New York.	Behavior and ecology of amphibia.
Hilger, Julie, Duke University.	Ornithology.
Holgerson, Dr. Holger, Stavanger, Norway.	Littoral marine entomology.
Hughes, Dr. and Mrs. B., Bogotá, Colombia.	Observation of wildlife.
Hunt, George, Harvard University.	Behavior and ecology of flycatchers.
Kamstedt, Brit, Stavanger, Norway.	Assistant to Dr. Holgerson.
Kremer, Dr. Peter, Washington University.	Algae.
Leen, Nina, Life Magazine, New York, N.Y.	Photography of primates.
Lewis, Harold, Life Magazine, New York, N.Y.	Assistant to Miss Leen.
Livermore, Mr. and Mrs. J. W., West Redding, Conn.	Observation of wildlife.
Livingston, Luzern G., Narberth, Pa.	Ornithology.

<i>Name</i>	<i>Principal interest</i>
Loftin, Horace, Florida State University.	Ecology of fresh-water fish.
MacArthur, John C., Marlboro College.	Ecology of birds.
MacArthur, John W., Marlboro College.	Ecology of birds.
Matthews, Henry, Lansdowne, Pa.	Ornithology.
McKitterick, Dr. Andy, Cornell University.	Behavior of cockroaches.
Meseth, Earl, Washington University.	Assistant to Dr. Sexton.
Myers, Charles W., University of Kansas.	Herpetology.
Nelson, Kurt, Chicago, Ill.	Observation of wildlife.
Nickerson, Dr. Norton, Washington University.	Botany.
Norcross, Mrs. Emily, Washington University.	Ornithology.
Ortleb, Edward, Washington University.	Behavior and ecology of amphibians and reptiles.
Outten, Dr. L. M., Mars Hill College.	Ichthyology.
Pavelko, Charlotte, Pasadena, Calif.	Observation of wildlife.
Prescott, Dr. and Mrs. G. W., University of Montana.	Phytoplankton.
Pye, Dr. and Mrs. David, Inst. of Laryngology and Otology, London.	Study of bats and acoustic organs of various neotropical animals.
Rasmussen, Mr. and Mrs., Washington University.	Ecology of amphibians and reptiles.
Raven, Mrs. Yvonne, American Museum of Natural History.	Observation of wildlife.
Rettenmeyer, Dr. and Mrs. Carl, Kansas State University.	Behavior and ecology of army ants.
Reynard, Dr. George B., Riverton, N.J.	Sound recordings of bird songs and calls.
Risebrough, Dr. R. W., Howard University.	Observation of wildlife.
Ross, Dr. and Mrs. R. D., Ambler, Pa.	Ornithology.
Ruckes, Dr. and Mrs. Herbert, American Museum of Natural History.	Hemiptera.
Sartori, Alexandra, Harvard University.	Observation of wildlife.
Sexton, Dr. Owen J., Washington University.	Behavior and ecology of amphibians and reptiles.

<i>Name</i>	<i>Principal interest</i>
Stern, Dr. William L., Smithsonian Institution.	Botany.
Strandtmann, Dr. and Mrs. R. W., Texas Technological College.	Entomology.
Swinebroad, Dr. Jeff, Rutgers State University.	Ornithology.
Taylor, Dr. Edward, Lawrence, Kans.	Herpetology.
Tyson, Edwin L., Florida State University.	Bat populations.
Wetmore, Dr. Alexander, Smithsonian Institution.	Ornithology.
Willis, Edwin O., University of California.	Ecology and behavior of birds and army ants.
Wilson, Mrs. Mae, Los Angeles, Calif.	Observation of wildlife.
Zweifel, Dr. and Mrs. Richard G., American Museum of Natural History.	Ecology of amphibians.

VISITORS

Approximately 155 visitors were permitted to visit the island for a day.

TABLE 1.—Annual rainfall, Barro Colorado Island, Canal Zone

Year	Total inches	Station average	Year	Total inches	Station average
1925.....	104. 37	-----	1944.....	111. 96	109. 30
1926.....	118. 22	113. 56	1945.....	120. 42	109. 84
1927.....	116. 36	114. 68	1946.....	87. 38	108. 81
1928.....	101. 52	111. 35	1947.....	77. 92	107. 49
1929.....	87. 84	106. 56	1948.....	83. 16	106. 43
1930.....	76. 57	101. 51	1949.....	114. 86	106. 76
1931.....	123. 30	104. 69	1950.....	114. 51	107. 07
1932.....	113. 52	105. 76	1951.....	112. 72	107. 28
1933.....	101. 73	105. 32	1952.....	97. 68	106. 94
1934.....	122. 42	107. 04	1953.....	104. 97	106. 87
1935.....	143. 42	110. 35	1954.....	105. 68	106. 82
1936.....	93. 88	108. 98	1955.....	114. 42	107. 09
1937.....	124. 13	110. 12	1956.....	114. 05	107. 30
1938.....	117. 09	110. 62	1957.....	97. 97	106. 98
1939.....	115. 47	110. 94	1958.....	100. 20	106. 70
1940.....	86. 51	109. 43	1959.....	94. 88	106. 48
1941.....	91. 82	108. 41	1960.....	140. 07	107. 41
1942.....	111. 10	108. 55	1961.....	100. 21	106. 95
1943.....	120. 29	109. 20	1962.....	100. 52	107. 07

TABLE 2.—Comparison of 1961 and 1962 rainfall, Barro Colorado Island (inches)

Month	Total		Station average	Years of record	1962 excess or deficiency	Accumulated excess or deficiency
	1961	1962				
January	1. 23	1. 86	2. 14	37	-0. 28	-0. 92
February	. 24	. 67	1. 31	37	-. 64	-0. 92
March	. 71	. 08	1. 21	37	-1. 13	-2. 05
April	5. 45	1. 84	3. 45	38	-1. 61	-3. 66
May	7. 86	12. 84	10. 95	38	+1. 89	-1. 77
June	10. 70	10. 13	10. 82	38	-. 69	-2. 46
July	6. 94	13. 26	11. 55	38	+1. 71	-. 75
August	19. 73	13. 21	12. 44	38	+. 77	+. 02
September	13. 33	13. 57	10. 34	38	+3. 23	+3. 25
October	17. 22	8. 43	13. 99	38	-5. 56	-2. 31
November	10. 84	13. 82	17. 85	38	-4. 03	-6. 34
December	5. 96	10. 81	11. 02	38	-. 21	-6. 55
Year	100. 21	100. 52	107. 07			-6. 55
Dry season	7. 63	4. 45	8. 11			-3. 66
Wet season	92. 58	96. 07	98. 96			-2. 89

BUILDINGS, EQUIPMENT, AND IMPROVEMENTS

The only major construction on Barro Colorado last year was a new boathouse. This will provide additional space for protection of the launches, speedboats, and canoes.

Maintenance activities on the island continued as usual. All houses were painted and their roofs repaired; new rain gutters were installed; the motor of the launch *Snook* and the three generators were completely overhauled; all the trails were cleared; and extensive repairs to the animal cages and pens were completed.

The expansion of the library also continued. New equipment was provided for both the library and the office.

Two guards were hired to maintain a constant patrol of the island. This has greatly alleviated the problem of poaching.

OTHER ACTIVITIES

The director continued research on the behavior of passerine birds and primates. Edwin L. Tyson completed his study of bat populations on the island, and Robert M. King finished work on the cytology of Panamanian Compositae. A new scientific aide, Thomas Crebbs of Rutgers University, has begun a study of the ecology, population structure, and behavior of several species of Fringillidae in the Canal Zone and adjacent parts of the Republic of Panama.

FINANCES

Trust funds for the maintenance of the island and its living facilities are obtained by collections from visitors and scientists, table subscriptions, and donations.

The following institutions continued their support of the laboratory through the payment of table subscriptions: Eastman Kodak Co., New York Zoological Society, and Smithsonian Institution. A new table subscription was received this year from Kansas State University. Donations are also gratefully acknowledged from Dr. Eugene Eisenmann and C. M. Goethe.

PLANS AND REQUIREMENTS

The research program of the bureau will expand considerably in the coming year.

Two new scientists will be added to the permanent staff: Dr. Robert L. Dressler and Dr. Neal G. Smith. Dr. Dressler is a botanist and Dr. Smith will work on ecology and animal behavior.

The National Science Foundation has approved a grant to install an electric cable from the mainland to the island. This will provide a reliable and abundant supply of electric power for the laboratory, replacing the costly and deficient generators which have always been a serious problem. The Panama Canal Company, which will install the cable, has already started preliminary work. It is hoped that the whole project will be completed before the end of the year.

As a result of these additions, it will be possible to install new equipment in the laboratory, keep more extensive records of scientific data, and build up collections of specimens. In particular, it is planned to reorganize and enlarge the herbarium and the botanical section of the library as rapidly as possible.

ACKNOWLEDGMENTS

The Canal Zone Biological Area can operate only with the excellent cooperation of the Canal Zone Government and the Panama Canal Company. Thanks are due especially to the former Lieutenant Governor, Col. Walter P. Leber; the Executive Secretary, Paul M. Runnestrand, and his staff; the Customs and Immigration officials; and the Police Division. Also deeply appreciated are the technical advice and assistance provided by P. Alton White, former chief of the Dredging Division, and members of his staff, and C. C. Soper of the Eastman Kodak Co.

Respectfully submitted.

MARTIN H. MOYNIHAN, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the National Air Museum

SIR: I have the honor to submit the following report on the activities of the National Air Museum for the fiscal year ended June 30, 1963:

Staff studies and planning for the new National Air Museum Building and exhibit continued. The fiscal 1964 budget presented to the Congress included planning funds for the new building.

Public interest in the historical air and space flight exhibit of the Museum continued to increase. The visitor count in the Air and Space Building for fiscal year 1963 was 2,673,618. For fiscal year 1962 it was 1,986,319. The largest single day's count was 38,355 (July 15, 1962).

Many historically significant accessions were received by the Museum during the year. Among them were: memorabilia of Col. Harold B. Willis, member of the Lafayette Escadrille, from Harold B. Willis, Jr.; original thermometer and barometer used by Dr. John Jeffries, first American to fly in a balloon ascension in England, November 30, 1784, from Dr. James Howard Means; multiple-stage rocket engine cluster for the space probe launch vehicle *Juno II*, from the Jet Propulsion Laboratory; bronze bust of Wilbur Wright, from Elmo N. Pickerill; the original *Friendship 7*, first U.S. orbital manned spacecraft, and flight clothing and gear from the *Friendship 7* orbital space flight, from NASA; American flag carried by astronaut Glenn on the *Friendship 7* flight, from John H. Glenn, Jr.; four engines used on the X-15 aircraft, from the Department of the Air Force; bronze sculpture of pioneer Charles S. (Casey) Jones, from the Academy of Aeronautics; medals and other memorabilia of Gen. Claire L. Chennault, from Mrs. Chennault; original oil portraits of astronauts Alan B. Shepard, Jr., and John H. Glenn, Jr., by artist Bruce Stevenson, from Mrs. Stevenson and son; and the original Sperry airplane Gyro Stabilizer and Sperry Gyro Horizon instruments, from the Sperry Gyroscope Co.

Information service continues as an active function of the Museum. Historical, technical, and biographical information on air and space flight is furnished to authors, researchers, historians, schools, Government agencies, students, and the public.

ADVISORY BOARD

No meetings of the Advisory Board were held during the year. Member Vice Admiral P. D. Stroop, USN, assigned to duties away

from Washington, D.C., was replaced by Vice Adm. William A. Schoech. Capt. E. P. Aurand, USN, was appointed alternate for Admiral Schoech.

SPECIAL EVENTS

Many distinguished visitors came to the Museum to see the exhibit or to participate in special presentation and commemorative ceremonies during the year. Among these were President John F. Kennedy; Attorney General and Mrs. Robert Kennedy; Astronaut and Mrs. John H. Glenn, Jr.; U.S. Senator Clinton P. Anderson; James E. Webb, Administrator of NASA; Edmund Converse, president of Bonanza Airlines; His Excellency, Antonio Garrigues, Ambassador of Spain, His Excellency, Dr. Roberto T. Alemann, Ambassador of the Argentine Republic; and Lafayette Escadrille pilot, Col. Charles H. (Carl) Dolan.

The director attended several annual meetings of aviation, aerospace, and educational organizations and societies. He also visited a number of Air Force and Navy bases, the FAA Academy, NASA space centers, and contractors of these agencies in the aerospace flight program. He lectured frequently on these visits. Much new historical material for the museum has resulted.

Paul E. Garber, head curator and historian, and curators Louis S. Casey and Kenneth E. Newland represented the Museum at a number of aviation and aerospace meetings during the year and spoke on the work of the Museum. Mr. Garber delivered 40 lectures.

IMPROVEMENTS IN EXHIBITS

Continuing experiments with display techniques in the Air and Space Building provide valuable experience in planning the exhibits for the new building.

REPAIR, PRESERVATION, AND RESTORATION

Storage, restoration, preservation, and the preparation of specimens for display in the new building continue at the Silver Hill, Md. facility.

ASSISTANCE TO GOVERNMENT DEPARTMENTS

A variety of services were extended during the year to the Federal Aviation Agency, NASA, the Library of Congress, the Department of Justice, the U.S. Navy, and the U.S. Air Force.

REFERENCE MATERIAL AND ACKNOWLEDGMENTS

The library, reference files, and photographic files of the Museum have increased in valuable research materials during the year. As space permits, these are being integrated into the files for the use of the Museum staff and other researchers.

The cooperation of the following persons and organizations in providing this material is sincerely appreciated and acknowledged:

- AIR FORCE, DEPARTMENT OF THE, AIR NATIONAL GUARD BUREAU, Washington, D.C.: Photostats, clippings, and typed pages, describing activities of the Air National Guard in Arkansas.
- AIR FORCE, DEPARTMENT OF THE; CHARLES V. EPPLEY, Edwards AFB, Calif.: Photos of Air Force parachutes, aircraft, and engines.
- ALLEN, MAJ. GEN. BROOKE E., Washington, D.C.: 1 booklet, *The Bolling Story*.
- AMERICAN AVIATION PUBLICATIONS, INC., Washington, D.C.: Book, *Aviation Age*, June 1953, "Key to Survival—Research and Development."
- ARMY MISSILE COMMAND, Redstone Arsenal, Ala.: *Jupiter C* drawings.
- BAKER, MISS MARY C., San Diego, Calif.: Four pages of photostats of a letter to Miss Baker from her brother regarding the construction of the floats for the entire Curtiss hydroplane.
- BALDWIN, LEON C., Fulton, N.Y.: Photostatic copy of a letter to the donor from Miss Ruth Curtiss, pertaining to the Baldwin airship, Signal Corps No. 1, which was designed and built by Thomas Scott Baldwin and powered by an engine developed by Glenn Curtiss.
- BALZER, VERNON W., Palos Verdes Estates, Calif.: Approximately 250 papers, being mostly correspondence, between Stephen M. Balzer (the donor's father) and Samuel P. Langley, Secretary of the Smithsonian Institution, his assistants including Charles M. Manly, and his successors including Dr. Charles G. Abbot, for the period November 5, 1898, to January 25, 1932.
- BELLANCA, MRS. DOROTHY, Galena, Md.: Periodicals, "L'Aeroteconica" Italian technical reports; "Air Ministry Aeronautical Research Committee Report and Memoranda"; "Commissariata Dell Aeronautica"; "Monografie Scientifiche Di Aeronautica"; "The Journal of the Royal Aeronautical Society"; "American Helicopter"; 1 book, *The Fighting Tanks Since 1916*, by R. E. Jones, G. H. Rarey, and R. J. Icks; photos and lists of Bellanca Aircraft; brochure, etc.
- BOEDECKER, KENNETH S., East Orange, N.J.: *Boedy's Album*, mounted photos of aviation personalities including negatives and index to mounted collection.
- BRAZALTON, DAVID, Bartonville, Ill.: 3 plate tracings of the Naval Aircraft Factory's N3N-3 convertible seaplane and Curtiss SOC-1 *Seagull*.
- BRITISH EMBASSY, Washington, D.C.: 3 photos, A-49,499 Vickers Vimy; A-49-499-A Vickers Vimy; A-49-499-B Alcock and Brown; photostat of The New York Herald, Monday, June 16, 1919, front page.
- BURTON, SQD. LDR. JOHN, BRITISH EMBASSY, Washington, D.C.: Manuals on the *Mosquito MK 35* (De Havilland).
- CAPRONI DiTALIEDO, COUNTESSE GIANNI, Italy: 3 books, Timina Caproni Guasti and Achille Bertarelli, *L'Aeronautica Italiana Nell' Imagine 1487-1875* (Milan, Museo Caproni, 1938); Timina Caproni Guasti and Achille Bertarelli, *Francesco Zambecconi Aeronauta*, Bologna (1752-1812) (Milan, Museo Caproni, 1932); *Gli Aeroplani Caproni*.
- CARCORAN, DONALD, Burns, Oreg.: Scrapbook containing 11 photos, 6 newspaper clippings of Henry Toneray and his helicopter.
- CASSOGNERES, EVERETT F., East Haven, Conn.: Photocopies of articles describing the Ryan Aeronautical Co., their ST trainer airplane, and the Menasco D-4 engine used to power this airplane; 1 photo of the Ryan STA airplane built in 1936, now owned and flown by the donor.
- CLARK, BARRETT, New York, N.Y.: 4 records, RLP 3401 "Wonderland of Science," a child's introduction to the automobile and the airplane; Riverside 5508 "World War I Fighter Planes in Action"; Riverside RLP 5505 "Air Force"; Riverside RLP 5510 "World War II Combat Planes in Action."

- CLARK, EDWIN R., Fitchburg, Mass.: Two newspapers, Springfield Republican, Monday, June 18, 1928; Boston Traveler, Tuesday, June 19, 1928.
- CLEVENGER, CLOYD P., D.F., Mexico: A multiautographed book, *Modern Flight*, by Cloyd P. Clevenger, illustrated by Clayton Knight.
- COFFYIN, KINGSLAND A., Philadelphia, Pa.: 1 photo album; 1 scrapbook containing newspaper articles and photographs.
- CROSS, JOHN W., Washington, D.C.: 28 issues of the Official Airline Guide.
- CROWTHER, G. RODNEY, III, Chevy Chase, Md.: 2 photographic prints 8 by 10 inches taken of *Echo I* satellite at 1,000 miles altitude, September 3, 1960.
- DAY, CURTISS, Elkhart, Ind.: Holterman scrapbook.
- DAY, MRS. GLADYS, Pacific Palisades, Calif.: Charles H. Day memorabilia; 1 scrapbook from Charles Healy and Gladys Day.
- DOUBLEDAY & Co., INC., Garden City, N.Y.: 4 flat-disk phonograph records, 33 $\frac{1}{3}$ rpm longplaying records, "Sounds of the U.S. Air Force, 1916-1960, Blast Off"; "America's First Man in Orbit," astronaut John Glenn in *Friendship 7*; *Aurora-7*, astronaut Scott Carpenter; *Sigma-7* astronaut Wally Schirra.
- FISKE, MRS. GARNER, Boston, Mass.: Scrapbook of G. H. Fiske; front page of May 22, 1927, issue of "La Presse" showing purported photo of Lindbergh; framed print containing two pictures, one showing ascent of Englishman, Cocking, in parachute basket; second shows tragic collapse of parachute during descent; framed print showing an exact representation of the first aerial ship *Eagle*.
- FRANTZ, HARRY W., UNITED PRESS INTERNATIONAL, Washington, D.C.: Articles on early press flights, "Atlantic Clipper Pioneers Air Route Through Pillars of Hercules," June 22, 1939; "Trans-Atlantic Press Flight, Atlantic Clipper," June 17-25, 1939; "Across the Andes," dated November 4, 1943.
- GAINER, J. E., AMERICAN AIRLINES, Washington, D.C.: A group of Glenn L. Martin aircraft specifications in the form of press releases; a report on the German commercial airline the *Deutsche Luft-Hansa* by O. E. Kirchner.
- GENERAL PRECISION, INC., LINK DIVISION, Binghamton, N.Y.: Data on Link Corporation.
- HALL, MRS. ROGER T., Cabin John, Md.: Framed color print of Montgolfier free flight balloon; framed color print of Charles balloon landing after first free flight.
- HILDES-HEIM, ERIK, Fairfield, Conn.: A 32-page illustrated leaflet titled, "Aeronautics in New York State" by Preston R. Bassett, reprinted from "New York History" journal; papers and photos pertaining to Dr. William W. Christmas.
- I.A.S. STUDENT ACTIVITIES, DAVID KAUFMAN, New York, N.Y.: 37 films.
- IPLAND, J. C., St. Petersburg, Fla.: 2 photos, J. D. Hill's airplane at Hadley Airport; Mr. Hill and Col. John Brown.
- JARRETT, COL. G. B., Aberdeen Proving Ground, Md.: Copies of drawings of British, German, and French World War I aerial bombs; copy of drawing of Flechettes.
- JUPTNER, JOSEPH P., Orange, Calif.: Book, *U.S. Civil Aircraft, ATC Number-1 to 100, Vol. I* by donor.
- KERLEY, ROBERT V., Detroit, Mich.: Air Service Engineering Division Report, September 16, 1924, *Engine Performance Curves and Sectional Views; Development of Aircraft Engines* by R. Schlaifer and *Development of Aviation Fuels* by S. D. Heron, bound in one volume; *Aviation Fuels and their Effects on Engine Performance*, NAVAER-02-1-511; *Aviation Fuels and their Effects on Engine Performance and Research on Aviation Spark Plug Problems* by the Ethyl Corp.
- KERNAN, STAFFORD, Washington, D.C.: 2 books, *World Aviation Annual, 1948*; *American Heroes of the War in the Air*.

- KEY, WILLIAM G., Washington, D.C.: 2 books, *Gli Aeroplani Caproni*; also other material on Caproni.
- LAIRD, E. M., Boca Raton, Fla.: Laird Airplane Co., brochure.
- LAMB, DR. W. KAYE, DOMINION ARCHIVIST, PUBLIC ARCHIVES OF CANADA, Ottawa, Canada: 2 drawings of general arrangements FC-2W2 landplane, general arrangements FC-2W2 seaplane (modified FC-2W).
- LEWIS, FREDERIC, New York, N.Y.: Fifteen 5- by 7-inch glass negatives of Wright 1911 glider at Kitty Hawk, N.C.
- MANNING, WING CMDR. R. V., ROYAL CANADIAN AIR FORCE, Ottawa, Canada: 2 volumes containing excerpts from RFC and RAF communiques of World War I.
- MCCALL, MRS. E. F., Oxford, Miss.: 31 pieces of correspondence from Chanute, W. Wright, Dr. Abbot, and Bellanca; 140 pages of assorted papers on "The Soaring Flight of Birds" and "The Construction of a Small Aeroplane."
- MCCAULEY, ERNEST G., Fort Lauderdale, Fla.: 2-page report by Mr. McCauley titled "Commemorating the Flight of the Spirit of St. Louis"; "Thrust for the Air Age" by Ted Duroske, a reprint from "Flying," November 1958, Ziff-Davis Publishing Co.
- MCCOMB, ROBERT P., Moultrie, Ga., and MILLER, HOWARD M., Fort Wayne, Ind.: 71 copies of outdated magazines, "Popular Aviation"; "Aerial Age Weekly"; "Western Flying"; "Sperryscope"; "Flight"; "Model Airplane News"; "U.S. Air Services."
- MEYER, ROBERT B., Bethesda, Md.: Book, *An Airplane in Every Garage*, by Daniel R. Zuck.
- MOOREHOUSE, HAROLD E., Williamsport, Pa.: 48 5- by 4-inch photos from the flying pioneers biographies used in A.A.H.S.
- MURPHY, SHERWIN, St. Joseph, Mich.: Copy of unfinished biography on Augustus Herring.
- NATHANSON, HARRY D., Brooklyn, N.Y.: 2 manuals, *Details of Aerial Bombs* by Air Ministry, February 1918; *Silhouettes of Aeroplanes* by Unknown.
- NAVY, DEPARTMENT OF THE, Washington, D.C.: 441 photographs from Adm. J. L. Callan's photograph album.
- NEWLAND, KENNETH E., Alexandria, Va.: Book, *Spitfire*, by John W. R. Taylor and Maurice F. Allward, 1946.
- NORMAN, WALLACE, Warren, Mich.: Three-view drawing of Curtiss Robin Airplane.
- OAKES, ROBERT S., NATIONAL GEOGRAPHIC SOCIETY, Washington, D.C.: Handbook titled *Instructions for the Care and Operation of Model A-1-E Hispano-Suiza Aeronautical Engines*. It was published during July 1918 by the Wright-Martin Aircraft Corp. of New Brunswick, N.J.
- PARRISH, WAYNE W., AMERICAN AVIATION PUBLICATIONS, Washington, D.C.: Assorted aviation material.
- PAWLEY, WILLIAM D., Miami, Fla.: Booklet, *Americans Valiant and Glorious*, a brief history of The Flying Tigers by William D. Pawley.
- PRINCE, FREDERICK H., Jr., Old Westbury, N.Y.: 3 bound volumes of "La Guerre Aérienne" for the period of November 1916 to May 1918.
- READ, REAR ADM. ALBERT C., Miami, Fla.: 1 book, *The Flight Across the Atlantic*, by Curtiss Aeroplane & Motor Corp.; a biographical sketch and service record of Rear Admiral Read; numerous cablegrams and naval signal dispatches; N-C-4 flight reports; pilots report, N-C-4; Radio Report-Trans Atlantic flight; newspaper clippings; magazine articles; U.S. Department of Agriculture Weather Bureau maps.
- REYNOLDS, BRUCE C., Santa Barbara, Calif.: *Barnstorming with Barnhart* as told to Bruce Reynolds by George E. Barnhart.

- SPANGLER, CHARLES B., Mountain View, Calif.: A book, *America's First Spaceman*, by Jewel Spangler Smaus and Charles B. Spangler. An autographed copy.
- SPARGO, JOHN, Old Bennington, Vt.: Postcards from the Caproni Aeroplant in Italy collected in 1918.
- SPRINGER, THOMAS ERIC, Los Angeles, Calif.: 60 photos; 1 souvenir issue of Douglas Aircraft 50th Anniversary of Naval Aviation; various newspaper clippings on Mr. Springer; biographical sketch.
- STADLMAN, ANTHONY, San Francisco, Calif.: Photos, drawing, biographical sketch, and newspaper clippings.
- TALBOTT, MRS. H. E., New York, N.Y.: Album of photos of the Dayton Wright Co.
- TRAINOR, GEORGE E., FORD MOTOR CO., Washington, D.C.: Films, "This is Aeronautronic" and "Blue Scout."
- TRUITT, JAMES M., THE WASHINGTON POST, Washington, D.C.: Memorabilia of James R. McConnell.
- VERNON, VICTOR, St. Petersburg, Fla.: Scrapbook of Victor Vernon.
- VINCENT, SYDNEY A., St. Petersburg, Fla.: 4- by 5-inch photos of Park A. Van Tassel's balloon; Ivy Baldwin's balloon; S. A. Vincent gliders; Ivy Baldwin's biplane.
- WALKER COMPANY, L. L., Houston, Tex.: 15 books and pamphlets on airport, aircraft, and engines, etc.
- WINTER, HENRY, San Clemente, Calif.: 1 canceled check of the Aeronautical School of Engineers (June 1911).
- YOUNG, EDWARD H., St. Louis, Mo.: Booklet, *Instone Air Line Time Table*, distributed in the fall of 1921.
- ZONTA INTERNATIONAL, Chicago, Ill.: Photo of Amelia Earhart; portrait, head and shoulders.

ACCESSIONS

Additions to the National Aeronautical and Space Collections received and recorded during the fiscal year 1963 totaled 443 specimens in 81 separate accessions, as listed below. Those from Government departments are entered as transfers unless otherwise indicated; others were received as gifts or loans.

- ACADEMY OF AERONAUTICS, La Guardia Airport, New York, N.Y.: Life-size bronze bust of Charles S. (Casey) Jones, pioneer aviator, educator, and founder of the Academy of Aeronautics (N.A.M. 1381).
- AIR FORCE, DEPARTMENT OF THE, McCLELLAN AIR FORCE BASE, Calif.: Collection of 213 models, 1:72 size, modeled by Roy S. Stone (N.A.M. 1360).
- ANDREWS AIR FORCE BASE, Md.: Gun camera from F-86A aircraft (N.A.M. 1364).
- SYSTEMS COMMAND, Washington, D.C.: XN-1, first U.S. all-inertial autonavigator to be successfully flight tested on a system; XN-2, first U.S. stellar-inertial autonavigator to successfully track stars in daylight flight (N.A.M. 1382).
- SYSTEMS COMMAND, WRIGHT-PATTERSON AIR FORCE BASE, Ohio: Thiokol XLR-11 Rocketjets with serial Nos. 5, 6, 13, and 14. These engines powered the X-15 aircraft (N.A.M. 1379).
- AMERICAN AIRLINES, Washington, D.C.: Diorama-type model of an American Airlines Boeing 707, showing interior layout of aircraft (N.A.M. 1344).
- AVCO RESEARCH AND ADVANCED DEVELOPMENT, Wilmington, Mass.: Original nose cap of the RVX1-5 nose cone test vehicle (N.A.M. 1401).
- BONANZA AIRLINES, Las Vegas, Nev.: Model of the Fairchild F-27 as flown by Bonanza Airlines (N.A.M. 1357).

- BROWN, MAJ. KIMBROUGH S., Bedford, Mass.: Contemporary French tapestry commemorating Lindbergh's flight to Paris (N.A.M. 1345).
- BRYANT, GLENN D., MISSISSIPPI STATE COLLEGE, State College, Miss.: Roll of gas cell material from airship *Shenandoah* (N.A.M. 1347).
- CHAMPLIN, WILLIAM H., JR., Rochester, N.H.: Verville Sports Trainer aircraft, single engine, two-place biplane (N.A.M. 1392).
- CHEMNAULT, MRS. CLAIRE L., Washington, D.C.: Memorabilia of General Claire L. Chennault including 20 medals and awards plus a Chinese scroll recounting the history of the Flying Tigers (N.A.M. 1387).
- CHRYSLER MOTORS CORP., Detroit, Mich.: Scale model of Mercury Redstone launch vehicle used in flight by Astronaut Alan Shepard, May 5, 1961 (N.A.M. 1406).
- COCHRAN, MISS JACQUELINE, New York, N.Y.: 1961 General Electric Trophy for outstanding achievement in aviation, Distinguished Service Medal, and Medal of the French Legion of Honor, all awarded to the donor (N.A.M. 1343).
- DAVIES, COL. JOHN M., Falls Church, Va.: Crash helmet worn by donor in Italy, World War I (N.A.M. 1374).
- DESIBOUR, MRS. ROBINSON, Washington, D.C.: Bronze medal commemorating the first North Pole flight of Richard E. Byrd, May 9, 1926 (N.A.M. 1353).
- DI TALIEDO, DR. GIOVANNI CAPRONI, Milano, Italy: Caproni Commemorative Gold Medal (N.A.M. 1352).
- DOOLITTLE, GEN. JAMES H., Redondo Beach, Calif.: Five personal watches either used by or awarded to the donor (N.A.M. 1398).
- DORNIER-WERKE, Germany: Model of Dornier DO-28 aircraft (N.A.M. 1355).
- DOUGLAS AIRCRAFT CO., Washington, D.C.: Model of a Douglas DC-2 aircraft (N.A.M. 1369).
- DRUCKER, LESLIE, Chicago, Ill.: Copy of gold Glenn Flight Commemorative Medalion which was presented to Mrs. Glenn (N.A.M. 1410).
- FOURTEENTH AIR FORCE ASSOCIATION, Allentown, Pa.: Original American Flag used by "Flying Tigers" at General Chennault's headquarters in China, and original design of 14th Air Force shoulder patch (N.A.M. 1380).
- FRANKLIN INSTITUTE, Philadelphia, Pa.: Aircraft engine combustion starter (N.A.M. 1362).
- GALBRAITH, FRED E., SR., Rutherford, N.J.: Parts and fragments from the *America* used on Admiral Byrd's transatlantic flight (N.A.M. 1367).
- GALL, CAPT. DONALD F., Newark, Del.: Piece of outer skin fabric from airship *Shenandoah* (N.A.M. 1384).
- GENERAL MOTORS CORP., ALLISON DIVISION, Garden City, N.J.: Model of Lockheed Electra II, 1:79 size (N.A.M. 1335).
- GLENN, JOHN H., JR., Manned Spaceflight Center, Houston, Tex.: Flag carried by Glenn on flight of *Friendship 7* (N.A.M. 1414).
- GRUMMAN AIRCRAFT CORP., Bethpage, Long Island, N.Y.: Three models of Grumman Aircraft: A2F-1 *Intruder*; AO-1 *Mohawk*; and XF5F-1 *Skyrocket* (N.A.M. 1336). Model of a Grumman W2F-1 aircraft (N.A.M. 1366). Model of a Grumman XF10F-1 *Jaguar* aircraft (N.A.M. 1370).
- HALL, MRS. ROBERT T., Cabin John, Md.: Purchase of two contemporary prints of first Montgolfier flight and the first Charles flight (N.A.M. 1396).
- HARTWICK, HERBERT D., Cayucos, Calif.: Model of Junkers-Larson JL-6, single engine monoplane (purchase) (N.A.M. 1342).
- HOFFMAN, MRS. CORA BENNETT, Estate of; New York, N.Y.: Memorabilia of J. Floyd Bennett (N.A.M. 1371).
- IVEY, ROBERT C., Parma, Ohio: Model, 1:24 size of Fokker F7/3m *Southern Cross* (N.A.M. 1395).

- JET PROPULSION LABORATORY, Pasadena, Calif.: Second, third, and fourth stage rocket cluster for the space-probe launch vehicle *Juno II* (N.A.M. 1346).
- KAYLAS, ALEXANDER J., New Haven, Conn.: Memorabilia connected with donor's activities as a member of the 14th Air Force in World War II (N.A.M. 1400).
- KELLY, KENNETH, Bethesda, Md.: Two World War I aircraft machineguns: one, a German Spandau with ammunition belt and case; the other, a British Vickers aircraft machinegun (N.A.M. 1337).
- KLEAN, LESTER E., Bensenville, Ill.: Model of Wright brothers' 1903 Flyer (purchase) (N.A.M. 1399).
- KLIEGLE, R. P., Hampton Falls, N.H.: Bowlius Baby Albatross sailplane single-place pod fuselage with tubular boom support for empennage (N.A.M. 1388).
- MCKNEW, DR. THOMAS, NATIONAL GEOGRAPHIC SOCIETY, Washington, D.C.: Seven framed color portraits and pictures of astronauts (N.A.M. 1338).
- MARTIN COMPANY, Baltimore, Md.: Martin Matador Missile (N.A.M. 1372).
- MASSIN, ALEX, Toronto, Canada: Four USAF uniform insignia, World War II (N.A.M. 1391).
- MEANS, DR. JAMES HOWARD, Boston, Mass.: An original holograph manuscript by Francis Herbert Wenham of England, "On Some Conditions of Aerial Flight," delivered by Octave Chanute before the Boston Aeronautical Society, March 1, 1897 (N.A.M. 1340). Thermometer and barometer used by Dr. John Jefferies in a balloon ascension in England, November 30, 1784, and January 7, 1785, for first flight across the English Channel. First American to fly (N.A.M. 1341).
- MEMBERS OF WAF AND USAF NURSES, New York, N.Y.: Wood inlay picture by Paul Spindler of a McDonnell F-101 *Voodoo* airplane flying over a French village (N.A.M. 1363).
- NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER, Hampton, Va.: Model of Bell X-1 wind tunnel (N.A.M. 1393). LEWIS RESEARCH CENTER, Cleveland, Ohio: General Electric TG-180 turbojet engine (N.A.M. 1413). General Electric I-40 turbojet engine (N.A.M. 1412). Washington, D.C.: *Friendship 7* spacecraft with manikin and display-rig; also astronaut's personal equipment (N.A.M. 1368). John Glenn's flight clothing (N.A.M. 1375).
- NAVY, DEPARTMENT OF THE, Washington, D.C.: Propeller and drive assembly for a fuel pump used on the NC-3 during 1919 flight across Atlantic (N.A.M. 1349). BUREAU OF NAVAL WEAPONS, Washington, D.C.: Aichi M6A1 Sieron Aircraft (Japanese), a J-35 aircraft engine and a Liberty engine propeller (N.A.M. 1365). Aichi B7A-1 *Grace* Aircraft, a Japanese Navy carrier bomber (N.A.M. 1377). Curtiss N-9 Navy training aircraft, World War II, missing components (N.A.M. 1405). NAVAL ACADEMY, Annapolis, Md.: General Electric electrically operated TG-100 turboprop cutaway (N.A.M. 1356). NAVAL OBSERVATORY, Washington, D.C.: A select group of navigation instruments illustrative of developmental steps in historical technical progress (N.A.M. 1351). NAVY AIR MATERIAL CENTER, Philadelphia, Pa.: Group of five models of U.S. Navy types to random scales—N-1, NC-7, HS-3, H-16, and ZR-1 *Shenandoah* (N.A.M. 1354).
- NEWCOMB, CHARLES J., Trappe, Md.: Wright brothers Model K, 1:16 size model of 1915 aircraft (purchase) (N.A.M. 1404).
- NEWLAND, KENNETH E., Alexandria, Va.: Scale model of Thor-Able launch booster with model of RVX1-5 nose cone on top (N.A.M. 1402). Scale model of Jupiter Rocket Launch vehicle used in Able-Baker project (N.A.M. 1407).
- NORTHROP AIRCRAFT CORP., Hawthorne, Calif.: 1:30 model of Northrop T-38 aircraft in which Jacqueline Cochran established speed records August-October 1961 (N.A.M. 1376).

- PAN AMERICAN AIRWAYS SYSTEM, New York, N.Y.: Six flags and two poles from the *Yankee Clipper* used on transatlantic flights (N.A.M. 1350).
- PICKERILL, E. N., Mineola, N.Y.: Life-size bronze bust of donor (N.A.M. 1359). Bronze bust of Wilbur Wright (N.A.M. 1358).
- RAMSEY, MRS. DEWITT, Washington, D.C.: Bas-relief portrait in Wedgwood of Sir John Alcock and a collection of seven prints of watercolors illustrating famous flights (N.A.M. 1373).
- ROCHESTER CITY SCHOOL DISTRICT, Rochester, N.Y.: Continental Motors Corp. Engine, model A65-S, 4-cylinder, air cooled; equipped with starter, Stromberg carburetor and Sensenich propeller (N.A.M. 1378). Link Aviation Devices, Binghamton, N.Y., Trainer No. S-W C-37142 *Jitter Bug, Jr.* (N.A.M. 1409).
- ROCKWELL, COL. PAUL, Asheville, N.C.: French Voluntaire World War I medal awarded to Kiffen Rockwell, a member of the Lafayette Escadrille (N.A.M. 1408).
- SHOWERS, MRS. ELSIE F.: Aircraft float light, World War II (N.A.M. 1348).
- SOARING SOCIETY OF AMERICA, Los Angeles, Calif.: The "Gold C" and "Diamond C" plaques awarded by the Soaring Society of America (N.A.M. 1361).
- SPANISH AIR FORCE, Washington, D.C.: Model of Dornier Wal *Plus Ultra*, first aircraft to complete crossing of South Atlantic from Spain to Argentina, January 21-31, 1926 (N.A.M. 1385).
- SPERRY GYROSCOPE CO., Great Neck, N.Y.: Gyro stabilizer for airplanes. Used in tests aboard a Curtiss "S" Flying Boat at Hammondsport, N.Y., by Lawrence Sperry in 1913. Immediate predecessor of the 1914 model which won the 50,000-fr. safety prize in Paris (N.A.M. 1390).
- STEVENSON, MRS. BRUCE AND SON, New York, N.Y.: Life-size portrait in oils; one of John H. Glenn, Jr., and the other of Alan B. Shepard, Jr. (N.A.M. 1389).
- TALBOT, MRS. HAROLD E., New York, N.Y.: Propeller with clock in hub (N.A.M. 1411).
- THAW, A. BLAIR, Washington, D.C.: Marlin Rockwell machine gun said to have been used by Col. William Thaw on his Spad aircraft in World War I (N.A.M. 1386).
- TRACY, DANIEL, Cleveland, Ohio: Model of Deperdussin aircraft (purchase) (N.A.M. 1394).
- VIRGINIA POLYTECHNIC INSTITUTE, Blacksburg, Va.: Lycoming air-cooled radial aviation engine (9 cyl.) Model R-680-BA, serial No. 2,751.240 h.p. (N.A.M. 1397).
- WILLARD, KENNETH A., Los Altos, Calif.: Radio-controlled, gasoline-powered model airplane (N.A.M. 1403).
- WILLIS, HAROLD B., JR., Boston, Mass.: Memorabilia of Col. Harold B. Willis as a member of the Lafayette Escadrille (N.A.M. 1339).
- WISE, MRS. DOROTHY, Washington, D.C.: Memorabilia of "Flying Tigers" Operations in China, World War II, including silk map of Western and Eastern China used by Capt. John Birch (N.A.M. 1383).
- WRIGLEY, PHILIP K., Chicago Ill.: Curtiss 1911 flight control, Westmore propeller manufactured in Chicago, Curtiss propeller (World War I), Paragon propeller (N.A.M. 1415).

Respectfully submitted.

PHILIP S. HOPKINS, *Director.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution,

Report on the National Cultural Center

SIR: I have the honor to submit, on behalf of the Board of Trustees, a status and financial report on the National Cultural Center for the period April 1959 through June 30, 1963.

ORGANIZATION

Public Law 85-874, September 2, 1958, established the National Cultural Center as a bureau of the Smithsonian Institution, to be directed by a Board of Trustees to be composed as follows: The Secretary of Health, Education, and Welfare; the Librarian of Congress; the Assistant Secretary of State for Public Affairs; the Chairman of the Commission of Fine Arts; the President of the Board of Commissioners of the District of Columbia; the Chairman of the District of Columbia Recreation Board; the Director of the National Park Service; the Commissioner of U.S. Office of Education; the Secretary of the Smithsonian Institution; 3 Members of the Senate appointed by the President of the Senate and 3 Members of the House of Representatives appointed by the Speaker of the House of Representatives *ex officio*; and 15 general trustees who must be citizens of the United States.

Mrs. John F. Kennedy and Mrs. Dwight D. Eisenhower serve as honorary cochairmen.

In addition, the act provided for the establishment of an Advisory Committee on the Arts, composed of such members as the President may designate to serve at the pleasure of the President. The members of this committee are individuals who are recognized for their knowledge of, or experience or interest in, one or more of the performing arts.

At the present time, the Board of Trustees and elected officers of the Center are as follows:

Trustees:

Howard F. Ahmanson.
Floyd D. Akers.
Lucius D. Battle.
Ralph E. Becker.
K. LeMoyne Billings.
Edgar M. Bronfman.
John Nicholas Brown.
Ralph J. Bunche.

Leonard Carmichael.
Anthony J. Celebrezze.
Joseph S. Clark.
J. William Fulbright.
Mrs. George A. Garrett.
Francis Keppel.
Mrs. Albert D. Lasker.
George Meany.

Trustees—Continued

L. Quincy Mumford.
 Mrs. Charlotte T. Reid.
 Richard S. Reynolds, Jr.
 Frank H. Ricketson, Jr.
 Leverett Saltonstall.
 Mrs. Jouett Shouse.
 L. Corrin Strong.

Frank Thompson.
 Walter N. Tobriner.
 William Walton.
 William H. Waters, Jr.
 Conrad L. Wirth.
 Jim Wright.

Chairman.—Roger L. Stevens.

Vice Chairman.—L. Corrin Strong.

Treasurer.—Daniel W. Bell.

Counsel.—Ralph E. Becker.

Assistant Secretary.—Mrs. James Cantrell.

Assistant Treasurers.—Paul Seltzer, Kenneth Birgfeld.

As directed in the act, the Board shall (1) present classical and contemporary music, opera, drama, dance, and poetry from this and other countries; (2) present lectures and other programs; (3) develop programs for children and youth and the elderly in such arts designed specifically for their participation, education, and recreation; and (4) provide facilities for other civic activities at the Cultural Center.

While congressional action provided the site upon which the Center will be built, it was specified that construction funds should be raised by the voluntary contributions of the American people. Congress therefore authorized a nationwide fund-raising campaign, the first such national campaign committed to a cultural enterprise.

PROGRESS DURING 1962-63

Since the beginning of 1962, the Center has been vigorously engaged in a number of varied fund-raising programs:

(1) *President's business committee.*—Under the chairmanship of Ernest R. Breech, formerly chairman, Ford Motor Co., and now director and chairman of Trans World Airlines, Inc., a committee has been formed to seek contributions to the Center from American industry and business. The goal set is \$6 million, or one-fifth of the total cost of the Center. Some of the most prominent businessmen in the United States have agreed to serve upon this committee and to solicit industrial contributions within those areas with which they are identified.

(2) *Seat endowment campaign.*—The President has appointed Edgar M. Bronfman, president of Joseph E. Seagram & Sons, Inc., as chairman of the Seat Endowment Committee. By means of this program, individuals and organizations are able to endow a permanent seat in one of the Center's three halls. A tax-deductible donation of \$1,000 will entitle the donor to lasting recognition as a virtual founder of the Center and his gift will be acknowledged by a bronze plaque affixed to the back of the seat.

(3) *Service band recordings.*—For the first time, the music of the four U.S. military bands has been recorded for sale to the public, and all profits from the sale of the albums are being given to the Cultural Center. The records were released by RCA Victor in May 1963 and to date have sold nearly 150,000 copies. The Center receives 95 cents per album after the initial overhead of approximately \$20,000 has been deducted.

(4) *Washington area campaign.*—The Greater Washington area, under the chairmanship of Mrs. Hugh D. Auchincloss, has been charged with the responsibility of raising \$7.5 million, or one-fourth of the total cost of the Center. The committees have now been formed and all fund-raising projects in this area put into vigorous action. Involving some 5,000 workers, the programs include a Special Gifts Campaign to solicit donations of \$1,000 and over, and a General Campaign enlisting support from the area's schools and universities, businesses, labor unions, the professions, fraternal orders, etc., for contributions of up to \$1,000.

ARCHITECTURAL PLANNING

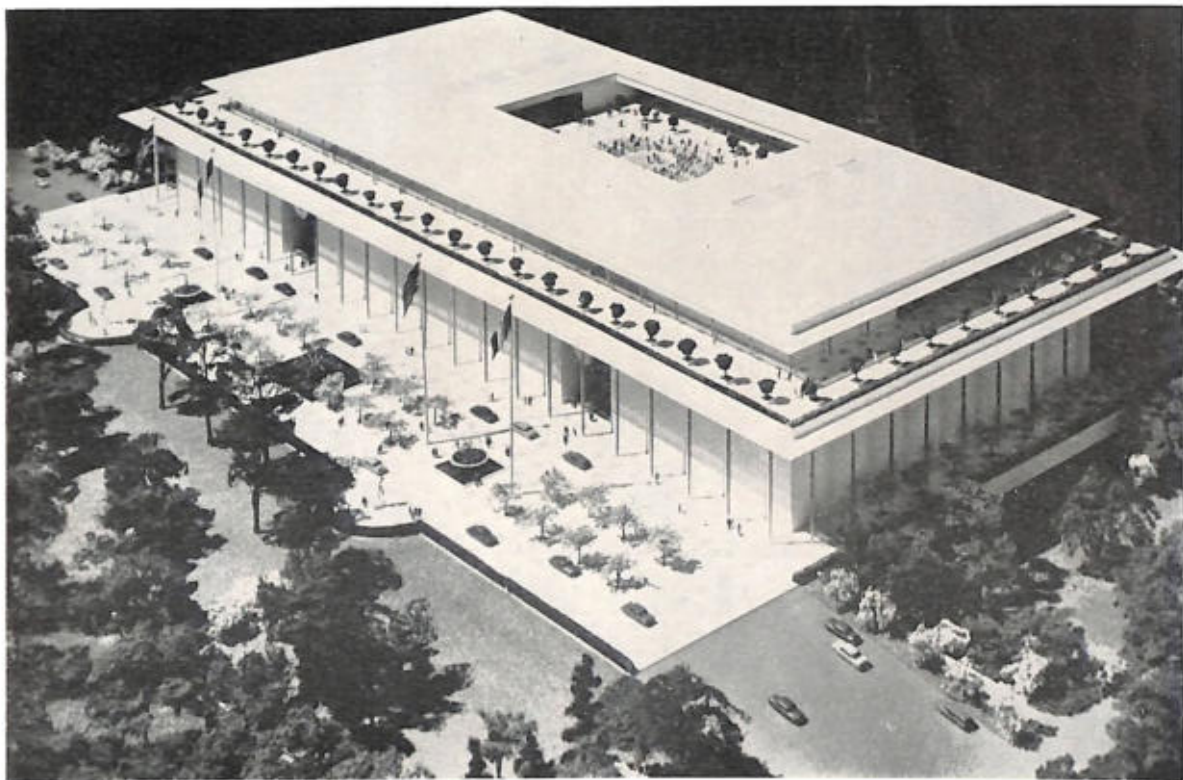
With the advent of 1962 the Trustees, feeling that the original \$75 million concept of the Center was unnecessarily costly, asked the architect, Edward Durell Stone, to furnish an alternative design. In the summer of that year, Mr. Stone provided a series of plans for grouping the three halls (1,200-seat theater; 2,750-seat symphony hall; and 2,500-seat hall for opera, ballet, and musical theater) under a single roof—at less than one-half the original cost. In addition, a garden-like roof area, with retractable roof insuring use in all weather, was designed to accommodate band concerts, art exhibits, festivals, children's theater, theater-in-the-round, and two restaurants.

In September 1962 the new model was presented to the Center's two honorary cochairmen, Mrs. Kennedy and Mrs. Eisenhower, as well as to the Board of Trustees and the Commission of Fine Arts. It was received with unanimous enthusiasm and approval.

The site designated by Congress for the Center is the area in the District of Columbia bounded by the Inner Loop Freeway on the east, the Theodore Roosevelt Bridge approaches on the south, Rock Creek Parkway on the west, and New Hampshire Avenue and F Street on the north.

FUTURE PROSPECTS

By June 1963, all the aforementioned fund-raising programs were well launched, and prospects of attaining individual program quotas were promising. In March 1963 a conditional grant of \$5 million was secured from the Ford Foundation, payable when the Center's fund-raising total reaches \$15 million.



Model of National Cultural Center.

In addition to this welcome boost to the campaign, the Center was fortunate in receiving a most generous gift of marble from the Government of Italy.

Approaching the expiration of the 5-year term for fund-raising specified in the original act, a 3-year extension, to September 1966, was pending in Congress at the end of the fiscal year. Under the terms of the extension, the number of general trustees will be increased from 15 to 30.

While the outset of a national fund-raising campaign of this magnitude must inevitably be slow, the time has now arrived—when we have one-third of the total funds required—when we can anticipate with confidence the rapid realization of our ultimate goal to create in the Nation's Capital a national center for the performing arts.

Respectfully submitted.

ROGER L. STEVENS, *Chairman.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

The National Cultural Center Financial Report for the period July 1, 1963, through November 30, 1963, follows:

AUDIT

*December 4, 1963
Washington, D.C.*

TO THE BOARD OF TRUSTEES OF
THE NATIONAL CULTURAL CENTER
Washington, D.C.

Gentlemen:

We have examined the books and records of THE NATIONAL CULTURAL CENTER for the period July 1, 1963, through November 30, 1963, and submit our report herewith as follows:

Exhibit A—Balance Sheet as of November 30, 1963.

Exhibit B—Statement of Income, Expenses, and Fund Balance for the Month of November 1963 and the Five Months Ended November 30, 1963.

Exhibit C—Statement of Income, Expenses, and Fund Balance for the Period from Inception April 1, 1959 through November 30, 1963.

Exhibit D—Analysis of Cash in Banks for the Period from Inception April 1, 1959 through November 30, 1963.

Schedule 1—Schedule of Time Deposits.

Schedule 2—Public Relations and Fund Raising Fees for the Period from Inception April 1, 1959 through November 30, 1963.

Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion the accompanying report presents fairly the financial position of THE NATIONAL CULTURAL CENTER at November 30, 1963 and the results of its operation for the period then ended in conformity with generally accepted accounting principles.

Respectfully submitted,

(S) JOHN J. ADDABBO
Certified Public Accountant

EXHIBIT A
BALANCE SHEET
November 30, 1963

ASSETS

Cash in banks:			
General accounts:			
National Cultural Center—general			
account.....	\$1,006,548.96		
Time deposits—Schedule 1.....	1,690,321.47	\$2,696,870.43	
Reserve accounts:			
National Cultural Center—reserve			
account.....	46,156.37		
Time deposits—Schedule 1.....	201,678.53	247,834.90	
Petty cash.....			619.37
Deposit with airlines.....			850.00
Pledges receivable:			
National General Account.....	5,439,167.00		
National tangible property.....	1,168,000.00		
National Seat Reserve Account.....	7,500.00		
President's Business Committee.....	579,800.01		
T.V. National.....	9,210.00		
Washington Area Building Fund—general			
account.....	325,333.46		
Washington Area Building Fund—reserve			
account.....	369,683.77		
Washington Area Seat Reserve Account....	30,236.24		
Washington Area Federal Employee Drive..	4,335.50		
Washington Area Federal Employee Drive—			
Seat Endowment.....	2,075.00		
Washington area tangible property.....	35,000.00		
School Children's Reserve Fund.....	300.00	7,970,640.98	
Fixed assets:			
Cost of land.....	146,000.00		
Construction costs.....	348,870.57		
Furniture and equipment.....	\$6,466.67		
Less: Reserve for deprecia-			
tion.....	2,131.71	4,334.96	499,205.53
Other assets:			
Videotape—Closed Circuit Telecast assigned			
value.....	150,000.00		
Deferred charges—Creative America.....	107,000.00	257,000.00	
Total assets.....			11,673,021.21

EXHIBIT A—Continued

BALANCE SHEET—Continued

LIABILITIES AND NET WORTH

Payroll taxes accrued.....		\$551.89
New worth:		
Pledges receivable.....	\$7,970,640.98	
Fund balance.....	3,701,828.34	
		<hr/>
Total net worth.....		11,672,469.32
		<hr/>
Total liabilities and net worth.....		11,673,021.21
		<hr/> <hr/>

EXHIBIT B

STATEMENT OF INCOME, EXPENSES, AND FUND BALANCE

For the Month of November 1963 and Five Months Ended November 30, 1963

Income	November	Five Months
Contributions and pledges paid in:		
General accounts:		
National General Account.....	\$507,897.66	\$1,531,492.95
President's Business Committee.....	300,233.99	689,149.99
Fine Arts Gifts Committee.....		5,000.00
Closed Circuit Telecast—net proceeds.....	470.00	908.90
Washington Area Building Fund—general account.....	2,268.90	40,896.07
Washington Area Federal Employee Drive.....	2,159.92	113,444.03
Austrian Embassy Benefit—net proceeds.....	(110.88)	11,247.11
Peter Pan Benefit.....	3,375.00	3,875.00
		<hr/>
Total general accounts.....	\$16,294.59	2,396,014.05
		<hr/>
Reserve accounts:		
National Seat Reserve Account.....	1,200.00	7,000.00
Washington Area Building Fund—reserve account.....	2,051.69	65,176.92
Washington Area Seat Reserve Account.....	1,400.00	7,905.95
Washington Area Federal Employee Drive—seat endowment.....	1,000.00	12,200.00
School Children's Reserve Fund.....	457.67	18,840.18
John F. Kennedy Memorial Fund.....	1,145.00	1,145.00
		<hr/>
Total reserve accounts.....	7,254.36	112,268.05
		<hr/>
Total income.....	\$23,548.95	2,508,282.10
		<hr/> <hr/>

EXHIBIT B—Continued

STATEMENT OF INCOME, EXPENSES, AND FUND BALANCE—Continued
For the Month of November 1963 and Five Months Ended November 30, 1963

Income	November	Five Months
Expenses:		
Salaries—major	\$3,889.57	\$24,403.29
Salaries—D.C.	1,736.18	13,836.75
Extra help	79.26	805.41
Depreciation—furniture and equipment	52.06	260.30
Equipment—rental and repairs	55.75	345.38
Meetings		26.00
Office supplies and postage	61.90	3,047.84
D.C. area expenses—general	418.52	4,048.19
College Drama Festival	1,000.00	1,000.00
Band recording		(1.25)
Sousa Memorial Fund	58.00	58.00
Seat endowment		129.90
Printing and publicity	578.93	1,772.52
Promotion	1,943.92	13,193.95
Publications	159.60	658.63
Telephone and telegraph	1,273.88	4,156.84
Travel and maintenance	1,300.80	7,894.63
Taxes—payroll and Civil Service	46.82	1,499.41
Unclassified	150.00	987.53
Accounting		1,200.00
Insurance		1,329.45
President's Business Committee		25,025.25
Federal Employee Drive		2,012.50
Public relations fees	3,000.00	18,000.00
Total expenses	15,805.19	125,690.52
Excess of receipts over expenses	807,743.76	2,382,591.58
Fund balance—beginning of period	2,894,084.58	1,319,236.76
Fund balance November 30, 1963	3,701,828.34	3,701,828.34

EXHIBIT C

STATEMENT OF INCOME, EXPENSES, AND FUND BALANCE
For the Period From Inception April 1, 1959, Through November 30, 1963

Income:

Contributions and pledges paid in:

General accounts:

National General Account.....	\$1, 778, 157. 44	
President's Business Committee.....	1, 193, 074. 99	
Fine Arts Gifts Committee.....	12, 500. 00	
Closed Circuit Telecast—net proceeds.....	362, 205. 44	
Washington Area Building Fund—general account.....	1, 147, 526. 59	
Washington Area Federal Employee Drive.....	128, 223. 28	
Austrian Embassy Benefit—net proceeds.....	11, 247. 11	
Peter Pan Benefit.....	3, 875. 00	
Total general accounts.....		\$4, 636, 809. 85

Reserve accounts:

National Reserve Account.....	510. 00	
National Seat Reserve Account.....	17, 666. 58	
Washington Area Building Fund—reserve account.....	170, 202. 60	
Washington Area Seat Reserve Account.....	26, 375. 90	
Washington Area Endowment Fund.....	894. 64	
Washington Area Federal Employee Drive—Seat Endowment.....	12, 200. 00	
School Children's Reserve Fund.....	18, 840. 18	
John F. Kennedy Memorial Fund.....	1, 145. 00	
Total reserve accounts.....		247, 834. 90

Total income..... 4, 884, 644. 75

Expenses:

Salaries—major.....	362, 899. 28
Salaries—D.C.....	78, 187. 14
Salaries—Fine Arts.....	10, 475. 87
Extra help.....	5, 830. 82
Depreciation—furniture and equipment..	2, 131. 71
Equipment—rental and repairs.....	4, 047. 61
Meetings.....	2, 213. 71
Office supplies and postage.....	20, 243. 32
D.C. area expenses—general.....	9, 912. 49
Fine Arts Gifts Committee.....	9, 057. 88
College Drama Festival.....	1, 000. 00
Band recording.....	1, 655. 29
Sousa Memorial Fund.....	58. 00
Seat endowment.....	1, 997. 84
Printing and publicity.....	42, 205. 19

EXHIBIT C—Continued

STATEMENT OF INCOME, EXPENSES, AND FUND BALANCE—Continued
 For the Period From Inception April 1, 1959, Through November 30, 1963

Expenses—Continued

Promotion.....	\$51,958.05	
Publications.....	8,365.26	
Telephone and telegraph.....	36,191.94	
Travel and maintenance.....	83,255.38	
Taxes—payroll and Civil Service.....	14,728.45	
Unclassified.....	1,973.37	
Accounting.....	11,900.00	
Insurance.....	4,347.48	
Interest.....	5,088.89	
President's Business Committee.....	87,818.95	
Federal Employee Drive.....	2,012.50	
Public relations fees—Schedule 1.....	320,009.99	
Miscellaneous fees.....	3,250.00	
		<hr/>
Total expenses.....		\$1,182,816.41
		<hr/>
Excess of receipts over expenses—fund balance.....		3,701,828.34
		<hr/> <hr/>

EXHIBIT D

ANALYSIS OF CASH IN BANKS

For the Period From Inception April 1, 1959, Through November 30, 1963

Cash in banks—general account:		
Contributions and pledges paid into general account—Exhibit C.....		\$4,636,809.85
Payroll taxes withheld.....		551.89
		<hr/>
Total received.....		4,637,361.74
Deduct:		
Operating expenses—Exhibit C.....	\$1,182,816.41	
Expenditures to acquire assets:		
Petty cash—Exhibit A.....	619.37	
Deposit with airline—Exhibit A.....	850.00	
Fixed assets—Exhibit A.....	499,205.53	
Other assets—Exhibit A.....	257,000.00	
		<hr/>
Cash in banks—general account.....		2,696,870.43
		<hr/>
Cash in banks—reserve accounts:		
Contributions and pledges paid into reserve accounts—Exhibit C.....		247,834.90
		<hr/>
Cash in banks—reserve accounts.....		247,834.90
		<hr/> <hr/>

SCHEDULE 1

SCHEDULE OF TIME DEPOSITS

November 30, 1963

Time Deposits per Exhibit A—Balance Sheet:

General accounts.....	\$1, 690, 321. 47
Reserve accounts.....	201, 67 . 53
Total time deposits per balance sheet.....	<u>1, 892, 000. 00</u>

Schedule of time deposits

Depository	Date deposited	Maturity date	Percent interest rate per annum	Amount deposited
American Security & Trust Co. Washington, D.C.	2/21/63	2/21/64	3½	\$40, 000. 00
	3/1/63	3/1/64	3½	100, 000. 00
	6/20/63	12/20/63	3¼	9, 000. 00
	8/16/63	2/17/64	3½	18, 000. 00
	8/16/63	2/17/64	3½	125, 000. 00
	11/18/63	2/17/64	3¾	100, 000. 00
Perpetual Building Association.... Washington, D.C.	11/15/63	12/15/64	4	200, 000. 00
Manufacturers Hanover Trust Co. New York, N.Y.	11/18/63	11/18/64	3¾	200, 000. 00
Irving Trust Co..... New York, N.Y.	11/18/63	5/17/64	3¾	200, 000. 00
National Bank of Detroit..... Detroit, Mich.	11/18/63	11/18/64	4	200, 000. 00
Morgan Guaranty Trust Co..... New York, N.Y.	11/18/63	11/18/64	3¾	200, 000. 00
Manufacturers Nat'l Bank of De- Detroit..... Detroit, Mich.	11/18/63	11/18/64	3¾	200, 000. 00
Home Savings and Loan Associa- tion..... Beverly Hills, Calif.	11/18/63	11/18/64	4. 85	300, 000. 00
Total time deposits.....				<u>1, 892, 000. 00</u>

SCHEDULE 2

PUBLIC RELATIONS AND FUND RAISING FEES

For the Period From Inception April 1, 1959, Through November 30, 1963

Tamblyn and Brown—April 1959 to January 1960.....	\$58, 250. 00
George A. Brakeley and Co.—April 1960 to June 1961.....	106, 000. 00
Randolph G. Bishop—April 1959 to June 1961.....	25, 749. 99
Carleton Sprague Smith—August 1960 to February 1961.....	7, 860. 00
Lobsenz and Co.—December 1961 to August 1962.....	68, 000. 00
Ruder and Finn—August 1962 to January 1963.....	27, 150. 00
Thomas Deegan and Co.—February 1963 to November 1963.....	27, 000. 00
Total.....	<u>320, 009. 99</u>

Report on the Library

SIR: I have the honor to submit the following report on the activities of the Smithsonian library for the fiscal year ended June 30, 1963:

ACQUISITIONS

The acquisitions section received 118,101 publications during the year. Included in this total were 3,065 purchased items and 1,057 journal subscriptions. The rest were received as gifts and exchanges. Arrangements were established with 142 scientific and learned organizations for the exchange of additional publications, and 1,540 items required special search to obtain.

Interested donors presented the library with valuable and difficult to locate publications. Some of the outstanding are:

"Colonial Records, 1660-1790," and "Pennsylvania Archives, 1661-1790," from Mrs. William A. McGuire, Johnstown, Pa.

"Susquehanna Company Papers," edited by Julian P. Boyd, from the Cornell University Press.

Corteseo, Armando, and Avelino Teixeira da Mota. *Portugaliae Monumenta Cartographica*. Lisbon, 1960. 5 vols. and index, from the Comissão Executiva do V Centenario da Morte do Infante D. Henrique, Lisbon, Portugal.

34 volumes from the estate of Mrs. Helen Augusta Mosher, Marblehead, Mass.

28 volumes on art from the library of the late Henry Salem Hubbell, Miami, Fla.

647 volumes from the estate of Mrs. Dora W. Boettcher, Washington, D.C.

972 periodicals on electronics from Mrs. J. B. Brady, Somerset, Md.

Ross, Marvin C. "Catalogue of the Byzantine and Early Mediaeval Antiquities in the Dumbarton Oaks Collection," vol. 1, Metalwork, Ceramics, Glass, Paintings, from the author, Washington, D.C.

45 issues of the Baltimore Sun Almanac, 1876-1925, from Miss Ruby Smith, Washington, D.C.

American Topical Society. Flowers and botanical subjects on stamps, from Dr. Willard F. Stanley, Fredonia, N.Y.

Bruce, A. W. "The Steam Locomotive in America," from Thomas T. Taber, Madison, N.J.

Antrim, Earl. "Civil War Prisons and Their Covers," from the author. Nampa, Idaho.

Dredge, James. "A Record of the Transportation Exhibits at the World's Columbian Exposition of 1893," from Mrs. B. B. Bierer, Jr., Washington, D.C.

Greenwell, G. C. "A Practical Treatise on Mine Engineering, 1855," from Cornelius U. S. Roosevelt, Washington, D.C.

Perlman, Bernard B. "The Immortal Eight, American Painting from Eakins to the Armory Show (1870-1913)." 1962.

Brooks, Van Wyck. "John Sloan, a Painter's Life." 1955. From Mrs. John Sloan, Wilmington, Del.

Duplicate and extraneous materials sent to other libraries amounted to 58,818. Of this, 51,512 pieces went to the Library of Congress, 3,018 to the National Library of Medicine, and 1,375 went to other agencies. The section handled a total of 176,919 pieces of material during the year.

CATALOGING AND BINDING

The catalog section cataloged 7,146 volumes, recataloged 234 items, transferred 203 publications, discarded 583 volumes, recorded 32,981 serials in the Serial Record, and filed 31,270 cards into the card catalog. In addition, 563 trade catalogs and 1,945 titles of short-form cataloging were added to the collection. Cataloging of newly acquired publications on a current basis was emphasized.

The binding unit prepared 6,600 volumes of books and journals for binding by a commercial binder. The hand-binding staff preserved 2,957 volumes and pamphlets which were either too fragile or valuable to be sent outside the Institution for repair.

REFERENCE AND CIRCULATION

The reference librarians answered 31,769 requests for specific types of information, replied to 2,511 pieces of correspondence, circulated 35,781 books and journals, and cleared the loan records on 28,874 volumes. No record is kept of the circulation of books and journals assigned to the division collections where they circulate freely within the division. Publications borrowed from other libraries, chiefly the Library of Congress, totaled 6,423, and 992 volumes were lent. The reading and reference facilities of the central and branch libraries were used by 27,267 persons.

BRANCH LIBRARIES

The branch library for the Museum of History and Technology answered 13,057 reference questions, circulated 13,509 books and journals, and added 563 trade catalogs to the collection. Visitors using the library facilities totaled 6,212.

The Bureau of American Ethnology branch library answered 1,964 reference questions, circulated 1,100 books and journals, and provided assistance of 1,300 visitors. With improved physical rearrangement of the collection, addition of new equipment, and a revised system of book selection, the use and importance of this library are developing.

Procedures for ordering and binding of books and journals were revised for the branch library of the Smithsonian Astrophysical Observatory, Cambridge, Mass. The number of visitors using this library was 7,083, reference questions answered numbered 2,521, and 1,998 books and journals were circulated.

A plan to organize and control the collection in the entomology branch library was put into operation. A. J. Spohn, formerly with

the National War College, was appointed librarian to succeed Miss Emily Bennett.

PROGRAMS AND FACILITIES

With the addition of the east wing to the Natural History Building, the central library acquired new space adjacent to its present location. Renovation of this entire area was completed in April.

Features that contribute to the usefulness of the library consist of new equipment, adequate workspace for the staff, reading and browsing areas, new bookstacks with sliding reference shelves, study carrels, electric book lifts, bibliographical and packing areas, a rare book room, air conditioning, and good natural and artificial lighting.

The library for the National Collection of Fine Arts was moved to the second floor of the Natural History Building. Floor plans for this library, and for the library of the National Portrait Gallery in the Patent Office Building, were reviewed, and an estimate for furniture and equipment was submitted.

STAFF CHANGES AND ACTIVITIES

Mrs. Mary A. Huffer was appointed chief of the reference and circulation section and Jack Marquardt assumed the duties of reference librarian in charge of the central reference section. Salvador Waller, formerly with the Office of Technical Services, joined the catalog section, and Miss Mildred Raitt, formerly with the Chamber of Commerce, was appointed order librarian.

Staff members attended the Special Libraries Association and American Library Association annual conferences. Special courses and seminars provided the staff with an opportunity for growth and development.

SUMMARIZED STATISTICS

ACCESSIONS

	Volumes	Total recorded volumes, 1963
Smithsonian central library including the Museum of Natural History.....	2, 520	} 353, 774
Museum of History and Technology.....	5, 322	
Astrophysical Observatory (SI).....	3	13, 407
Smithsonian Astrophysical Observatory, Cambridge, Mass.....	642	2, 342
Radiation and Organisms.....	128	2, 167
Bureau of American Ethnology.....	714	39, 894
National Air Museum.....	192	1, 143
National Collection of Fine Arts.....	128	14, 519
National Zoological Park.....	5	4, 302
Total.....	9, 654	431, 548

Unbound volumes of periodicals and reprints and separates from serial publications, of which there are many thousands, have not been included in the above totals.

Exchanges:

New exchanges arranged.....	142
Specially requested publications received.....	1,540

Cataloging:

Volumes cataloged.....	9,888
Catalog cards filed.....	31,270

Serials: Number of serials recorded..... 32,981

Circulation: Loans of books and periodicals..... 35,781

Binding and repair:

Volumes sent to the bindery.....	6,705
Volumes repaired in the library.....	2,957

Respectfully submitted.

RUTH E. BLANCHARD, *Librarian.*

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on Publications

SIR: I have the honor to submit the following report on the publications of the Smithsonian Institution and its branches for the year ended June 30, 1963:

The publications of the Smithsonian Institution are issued partly from federally appropriated funds (Smithsonian Reports and publications of the National Museum, the Bureau of American Ethnology, and the Astrophysical Observatory) and partly from private endowment funds (Smithsonian Miscellaneous Collections, publications of the Freer Gallery of Art, and some special publications). The Institution also edits and publishes under the auspices of the Freer Gallery of Art the series *Ars Orientalis*, which appears under the joint imprint of the University of Michigan and the Smithsonian Institution. In addition, the Smithsonian publishes for sale to visitors a guidebook, a picture pamphlet, postcards and a postcard folder, color slides, a filmstrip on Smithsonian exhibits, a coloring book for children, and popular publications on scientific and historical subjects related to its important exhibits and collections. Through its publication program the Smithsonian endeavors to carry out its founder's expressed desire for the diffusion of knowledge.

The chief of the division continued to represent the Smithsonian Institution on the board of trustees of the Greater Washington Educational Television Association, Inc., of which the Institution is a member, and served on its executive committee. He and the assistant chief of the division represented the Institution at the annual meeting of the Association of American University Presses held in June at Cambridge, Mass.

Miss Ruth B. MacManus, assistant editor, who had been associated with the editorial operations of the Smithsonian Institution since 1928, died on November 17, 1962.

Ernest E. Biebighauser, a member of the editorial staff since 1953, left the Institution on January 7, 1963, to accept a position with the Coast and Geodetic Survey of the Department of Commerce.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

In this series there were issued 3 papers as follows:

Volume 145

No. 3. The problem of the *Viduae* in the light of recent publications, by Herbert Friedmann. 10 pp. (Publ. 4506.) July 20, 1962. (50 cents.)

- No. 4. Uniformity among growth layers in three ponderosa pine, by Waldo S. Glock, Paul J. Germann, and Sharlene R. Agerter. xiv+375 pp., 71 figs., 13 pls. (Publ. 4508.) February 21, 1963. (\$6.)

Volume 146

- No. 1. Aboriginal cultural development in Latin America: An interpretative review, edited by Betty J. Meggers and Clifford Evans. vi+148 pp., 20 figs. (Publ. 4517.) June 17, 1963. (\$5.)

SMITHSONIAN ANNUAL REPORTS

REPORT FOR 1961

The complete volume of the Annual Report of the Board of Regents for 1961 was received from the printer on November 15, 1962.

Annual Report of the Board of Regents of the Smithsonian Institution showing the operations, expenditures, and condition of the Institution for the year ended June 30, 1961. x+579 pp., illus. (Publ. 4478.)

The general appendix contained the following papers (Publ. 4479-4499):

- Some astronomical aspects of life in the universe, by Su-Ssu Huang.
- X-rays from the sun, by Herbert Friedman.
- The challenge of space exploration, by Robert C. Seamans, Jr.
- The Smithsonian's satellite-tracking program, by E. Nelson Hayes.
- The main lines of mathematics, by J. L. B. Cooper.
- Early experiments in instrument flying, by James H. Doolittle.
- Three famous early aero engines, by Robert B. Meyer, Jr.
- Organic chemistry: a view and a prospect, by Sir Alexander Todd.
- The new age of the sea, by Philip B. Yeager.
- Drilling beneath the deep sea, by William E. Benson.
- A natural history of trilobites, by H. B. Whittington.
- Chromosomes and the theory of heredity, by C. D. Darlington.
- Tropical climates and biology, by G. S. Carter.
- Outdoor aerobiology, by P. H. Gregory.
- The detection and evasion of bats by moths, by Kenneth D. Roeder and Asher E. Treat.
- The honey bee, by James I. Hambleton.
- Evolution, genetics, and anthropology, by A. E. Mourant.
- Australopithecines and the origin of man, by J. T. Robinson.
- The skull of Shanidar II, by T. D. Stewart.
- Heyerdahl's Kon-Tiki theory and its relation to ethnobotany, by F. P. Jonker.
- Minerals in art and archeology, by Rutherford J. Gettens.

REPORT FOR 1962

The report of the Secretary, which will form part of the 1962 Annual Report of the Board of Regents, was issued January 24, 1963.

Report of the Secretary and financial report of the Executive Committee of the Board of Regents for the year ended June 30, 1962. x+241 pp., 16 pls. (Publ. 4514.)

SPECIAL PUBLICATIONS

- Brief guide to the Smithsonian Institution, new ed. 80 pp., illus. (Publ. 4507.) October 9, 1962. (25 cents.)
- Preliminary field guide to the birds of the Indian Ocean, by George E. Watson, Richard L. Zusi, and Robert E. Storer. x+214 pp., 19 pls., 17 maps. (Publ. 4541.) February 28, 1963.
- Correspondence between Spencer Fullerton Baird and Louis Agassiz—Two pioneer American naturalists, collected and edited by Elmer Charles Herber. 237 pp., 16 pls. (Publ. 4515.) June 21, 1963. (\$5.)
- Author-subject index to articles in Smithsonian Annual Reports, compiled by Ruth M. Stemple and the Editorial and Publications Division. vi+200 pp. (Publ. 4503.) January 30, 1963.

REPRINTS

- A biographical sketch of James Smithson. 20 pp., illus. (Publ. 2276.) April 23, 1963. (50 cents.)
- Anthropology as a career, by William C. Sturtevant. 20 pp. (Publ. 4343.) April 12, 1963. (20 cents.)
- The story of transportation, by E. John Long. 36 pp., illus. (Publ. 4312.) May 25, 1963. (50 cents.)

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM

The editorial work of the National Museum continued during the year under the immediate direction of John S. Lea, assistant chief of the division. The following publications were issued:

REPORT

- The United States National Museum annual report for the year ended June 30, 1962. viii+195 pp., illus. January 24, 1963.

BULLETINS

- 100, volume 14, parts 1-4. Title page, table of contents, and index. vii+443-461 pp., May 16, 1963.
228. Contributions from the Museum of History and Technology: Papers 19-30, by members of the staff and others.
- Paper 29. The development of electrical technology in the 19th century:
2. The telegraph and the telephone, by W. James King. Pp. 273-332, 80 figs. Sept. 17, 1962.
- Paper 30. The development of electrical technology in the 19th century:
3. The early arc light and generator, by W. James King. Pp. 333-407, 92 figs. Sept. 17, 1962.
233. Host relations of the parasitic cowbirds, by Herbert Friedmann. ix+276 pp. June 13, 1963.
235. American military insignia, 1800-1851, by J. Duncan Campbell and Edgar M. Howell. xv+124 pp., 277 figs. June 27, 1963.

PROCEEDINGS

Volume 113

- Title page, table of contents, and index. Pp. i-v+637-660. Jan. 9, 1963.
- No. 3459. Plectrotaxy as a systematic criterion in lithobiomorphic centipedes (Chilopoda: Lithobiomorpha), by Ralph E. Crabill, Jr. Pp. 399-412, 1 fig. July 12, 1962.
- No. 3461. Synopsis of the Neotropical cockroach genus *Macrophyllodromia* (Orthoptera: Blattoidea, Epilampridae), by Isolda Rocha e Silva Albuquerque. Pp. 421-428, 14 figs. Aug. 29, 1962.
- No. 3465. The heleomyzid flies of America north of Mexico (Diptera: Heleomyzidae), by Gordon D. Gill. Pp. 495-603, 96 figs. Aug. 30, 1962.
- No. 3466. The non-brachyuran decapod crustaceans of Clipperton Island, by Fenner A. Chace, Jr. Pp. 605-635, 7 figs. Aug. 29, 1962.

Volume 114

- No. 3467. Scarab beetles of the genus *Onthophagus* Latreille north of Mexico (Coleoptera: Scarabaeidae), by Henry F. Howden and Oscar L. Cartwright. Pp. 1-135, 11 figs., 9 pls. Jan. 9, 1963.
- No. 3468. New species of spider wasps, genus *Auplopus*, from the Americas south of the United States (Hymenoptera: Psammocharidae), by R. R. Dreisbach. Pp. 137-211, 13 pls. Mar. 19, 1963.
- No. 3469. Some North American moths of the genus *Acleris* (Lepidoptera: Tortricidae), by Nicholas S. Obraztsov. Pp. 213-270, 7 figs., 18 pls. May 7, 1963.
- No. 3470. A revision of the North American annelid worms of the genus *Cambarincola* (Oligochaeta: Branchiobdellidae), by Richard L. Hoffman. Pp. 271-371, 79 figs. Mar. 6, 1963.
- No. 3471. Geographic variation in the thrush *Hylocichla ustulata*, by Gorman M. Bond. Pp. 373-387, 1 fig. Mar. 6, 1963.
- No. 3472. Review of the hawkfishes (family Cirrhitidae), by John E. Randall. Pp. 389-451, 16 pls. May 28, 1963.
- No. 3473. Studies of Neotropical caddisflies, I: Rhyacophilidae and Glossosomatidae (Trichoptera), by Oliver S. Flint, Jr. Pp. 453-478, 8 figs. Apr. 16, 1963.
- No. 3474. Weevils of the genus *Maemactes*, by David G. Kissinger. Pp. 479-486, 1 fig. Mar. 19, 1963.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

The editorial work of the Bureau continued under the immediate direction of Mrs. Eloise B. Edelen. The following publications were issued during the year:

- Seventy-ninth Annual Report of the Bureau of American Ethnology, 1961-62. ii+29 pp., 2 pls. 1963.
- Bulletin 181. Isleta paintings, with introduction and commentary by Elsie Clews Parsons. Edited by Esther S. Goldfrank. xvi+299 pp., 142 pls. (incl. 12 pls. in color). 1962.
- Bulletin 182. River Basin Surveys Papers, No. 25. Archeology of the John H. Kerr Reservoir Basin, Roanoke River, Virginia-North Carolina, by Carl F. Miller. With appendix: Human skeletal remains from the Tollifero (He6)

and Clarksville (Mc14) sites, John H. Kerr Reservoir Basin, Virginia, by Lucile E. Hoyme and William M. Bass. xvi+447 pp., 110 pls., 65 figs., 20 maps. 1962.

Bulletin 184. The Pueblo of Sia, New Mexico, by Leslie A. White. xii+358 pp., 12 pls., 55 figs. 1962.

Bulletin 185. River Basin Surveys Papers, Nos. 26-32. xii+344 pp., 57 pls., 43 figs., 5 maps. 1963.

No. 26. Small sites on and about Fort Berthold Reservation, Garrison Reservoir, North Dakota, by George Metcalf.

No. 27. Star Village: A fortified historic Arikara site in Mercer County, North Dakota, by George Metcalf.

No. 28. The dance hall of the Santee Bottoms on the Fort Berthold Reservation, Garrison Reservoir, North Dakota, by Donald D. Hartle.

No. 29. Crow-Flies-High (32MZ1), a historic Hidatsa village in the Garrison Reservoir area, North Dakota, by Carling Malouf.

No. 30. The Stutsman Focus: An aboriginal culture complex in the Jamestown Reservoir area, North Dakota, by R. P. Wheeler.

No. 31. Archeological manifestations in the Toole County section of the Tiber Reservoir Basin, Montana, by Carl F. Miller.

No. 32. Archeological salvage investigations in the Lovewell Reservoir area, Kansas, by Robert W. Neuman.

Bulletin 188. Shonto: A study of the role of the trader in a modern Navaho community, by William Y. Adams. xi+329 pp., 10 pls., 3 figs., 3 maps, 12 charts. 1963.

PUBLICATIONS OF THE ASTROPHYSICAL OBSERVATORY

The editorial work of the Smithsonian Astrophysical Observatory continued under the immediate direction of Ernest E. Biebighauser, until his transfer to the Department of Commerce. The year's publications in the series Smithsonian Contributions to Astrophysics are as follows:

Volume 5

No. 12. North-south asymmetry in solar spottedness and in great-storm sources. Pp. iii+187-208, 13 figs. 1962.

A long-term north-south asymmetry in the location of solar sources of great geomagnetic storms, by Barbara Bell.

On the unequal spottedness of the two solar hemispheres, by John G. Wolbach.

On short-period relations between north-south asymmetry in spottedness and in great-storm sources, by Barbara Bell and John G. Wolbach.

No. 13. Neutral hydrogen between galactic longitudes 200° and 265°, by R. J. Davis. Pp. 209-230, 6 figs. 1962.

No. 14. The space density of atmospheric dust in the altitude range 50,000 to 90,000 feet, by Paul W. Hodge and Frances W. Wright. Pp. 231-238, 2 figs., 1 pl. 1962.

No. 15. Solar radio bursts of spectral types II and IV: Their relations to optical phenomena and to geomagnetic activity, by Barbara Bell. Pp. 239-257, 2 figs. 1963.

Volume 7

Proceedings of the symposium on the astronomy and physics of meteors, held at Smithsonian Astrophysical Observatory, Cambridge, Mass., August 28-September 1, 1961. Whole volume. iv+314 pp., 117 figs., 22 pls. 1963.

PUBLICATIONS OF THE NATIONAL COLLECTION OF FINE ARTS

The following catalogs were issued by the Smithsonian Traveling Exhibition Service during the year:

The Daniells in India, 1786-1793. [44] pp., illus. (Publ. 4513.) 1962.
Old Master drawings from Chatsworth. 46 pp., 144 illus. 1962.

PUBLICATIONS OF THE FREER GALLERY OF ART

The field of stones: A study of the art of Shen Chou (1427-1509), by Richard Edwards. Freer Gallery of Art Oriental Studies, No. 5, **xxi**+131 pp., 51 pls. (Publ. 4433.) Nov. 7, 1962. (\$11.)
Ancient glass in the Freer Gallery of Art, by Richard Ettinghausen. 44 pp., with 99 illus. (incl. 3 pls. in color). (Publ. 4509.) July 16, 1962. (\$1.65.)
Chinese album leaves in the Freer Gallery of Art, by James Cahill. 48 pp., with 35 illus. (incl. 2 pls. in color). (Publ. 4476.) Nov. 30, 1962. (\$1.)
The Whistler Peacock Room (rev. ed.). vii+22 pp., 7 pls. (Publ. 4024.) Dec. 11, 1962. (35 cents.)
The Freer Gallery of Art of the Smithsonian Institution (reprint). 16 pp., illus. (Publ. 4504.) Aug. 8, 1962. (15 cents.)

REPORTS OF THE AMERICAN HISTORICAL ASSOCIATION

The annual reports of the American Historical Association are transmitted by the Association to the Secretary of the Smithsonian Institution and are by him communicated to Congress, as provided in the act of incorporation of the Association. The following report was issued during the year:

Annual Report of the American Historical Association for 1961. Vol. 1, Proceedings. 1962.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN REVOLUTION

In accordance with law, the manuscript of the 65th annual report of the National Society, Daughters of the American Revolution, was transmitted to Congress on May 16, 1963.¹

DISTRIBUTION

Requests for publications and information continued to increase during the year. The publications distribution section, under the immediate supervision of Mrs. Eileen M. McCarthy, received 38,397 requests for publications from foreign and domestic libraries, universities, research institutions, educational establishments, and individuals throughout the world. Visitors to the office and replies to inquiries numbered 30,053.

A total of 899,788 copies of publications and miscellaneous items were distributed: 67 Contributions to Knowledge; 13,207 Smithsonian

¹ D.A.R. reports are published as Senate documents and are not available from the Smithsonian Institution.

Miscellaneous Collections; 8,576 Annual Report volumes and 31,025 pamphlet copies of Report separates; 50,136 special publications; 164 reports of the Harriman Alaska Expedition; 43,257 publications of the National Museum; 17,722 publications of the Bureau of American Ethnology; 112,343 catalogs and leaflets of the National Collection of Fine Arts; 546 publications of the Freer Gallery of Art;² 18 Annals of the Astrophysical Observatory; 9,646 Smithsonian Contributions to Astrophysics; 679 War Background Studies; 1,763 reports of the American Historical Association; and 11,928 publications not issued by the Smithsonian Institution. Miscellaneous items: 15 sets of North American Wild Flowers and 127 North American Wild Flower prints; 8 Pitcher Plant volumes; 75,365 Guide Books; 17,529 picture pamphlets; 359,232 postcards; 25,626 postcard folders; 19,993 color slides; 96,230 information leaflets; 228 statuettes; 4,355 View-master reels.

The following titles were issued and distributed to libraries as a result of the Institution's participation in the National Science Foundation translation program: *Mammals of Eastern Europe and Northern Asia (Insectivora and Chiroptera)*, vol. 1, by S. I. Ognev; *Mammals of Eastern Europe and Northern Asia (Carnivora Fissipedia)*, vol. 2, by S. I. Ognev; *Mammals of U.S.S.R. and Adjacent Countries (Carnivora Fissipedia and Pinnipedia)*, vol. 3, by S. I. Ognev; *Mammals of U.S.S.R. and Adjacent Countries (Rodents)*, vol. 5, by S. I. Ognev; *Forty Years of Soviet Anthropology*, by G. F. Debets; *Short-Ears and Long-Ears on Easter Island*, by N. A. Butinov; *Problems in the History of Primitive Society*, by N. A. Butinov; *Terrestrial Mollusks of the Fauna of the U.S.S.R.*, by I. M. Likharev and E. S. Rammelmeier; *Fauna of Russia and Adjacent Countries (Amphibians)*, by A. M. Nikol'skii; *Fauna of U.S.S.R. (Crustacea, Anomura)*, vol. 10, No. 3, by V. V. Makarov; *The Chalcid Fauna of the U.S.S.R. (Chalcidoidea)*, by M. N. Nikol'skaya; *Flora of the U.S.S.R.*, vol. 2, V. L. Komarov, editor; *Special Ichthyology*, by G. V. Nikol'skii; *Freshwater Fishes of the U.S.S.R. and Adjacent Countries*, vol. 1, by Leo S. Berg; *Fauna of U.S.S.R.—Fishes (Gadiformes)*, vol. 9, No. 4, by A. N. Svetovidov; *Fundamentals of Paleontology*, Yu. A. Orlov, editor.

Respectfully submitted.

PAUL H. OEHSER,
Chief, Editorial and Publications Division.

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

² In addition to those distributed by the Gallery itself.

Other Activities

LECTURES

C. Fayette Taylor, emeritus professor of automotive engineering, Massachusetts Institute of Technology, delivered the fourth Lester D. Gardner lecture, on "Aircraft Propulsion: A Review of the Evolution of Aircraft Powerplants," in the auditorium of the Freer Gallery of Art on the evening of October 5, 1962. This lecture was published in full in the general appendix of the Annual Report of the Board of Regents of the Smithsonian Institution for 1962 (pp. 245-298).

Dr. John Howard Young, W. H. C. Vickers associate professor of archeology, Johns Hopkins University, lectured on "The Royal Sculptures of Commagene" in the auditorium of the Freer Gallery of Art on the evening of February 8, 1963. This lecture was sponsored jointly by the Smithsonian Institution and the Archaeological Institute of America.

Hugh Wakefield, keeper of circulation, Victoria and Albert Museum, London, England, lectured on "English Victorian Glass" in the auditorium of the Freer Gallery of Art on the evening of April 24, 1963.

Several lectures were sponsored by the Freer Gallery of Art and the National Gallery of Art. These are listed in the reports of these bureaus.

SCIENCE INFORMATION EXCHANGE

The Science Information Exchange receives, organizes, and disseminates information on scientific research in progress. Its mission is to facilitate planning and management of scientific research activities supported by Government and non-Government agencies and institutions by promoting the exchange of information that concerns subject matter, distribution, level of effort, and other data pertaining to current research in the prepublication stage. It helps program directors and administrators to avoid unwanted duplication and to determine the most advantageous distribution of research funds. It serves the entire scientific community by informing individual investigators about who is currently working on problems in their special fields.

The reorganization and expansion of the Exchange to provide current research information in the physical sciences, in addition to the life sciences, have constituted the major task during the past year and have progressed quite satisfactorily. The new physical sciences

division now has 15 members. The total staff has grown to about 115, and the plant capability and capacity have been almost doubled.

The acquisition of current research projects and proposals increased sharply from an annual rate of about 56,000 in 1962 to almost 75,000 in 1963. The total number of active projects on file has risen from 33,000 to almost 58,000.

Many new research programs have been added, and many new agencies, such as the Departments of Agriculture, Commerce, and Interior, have begun to register their current research activities. All Federal agencies with substantial research programs in basic and applied research are now participating. As the coverage of Federal programs approaches comprehensive proportions, increasing attention is being directed to securing the cooperation of universities, private foundations, State and city government research organizations, and industrial laboratories.

The January 10, 1963, report of the President's Scientific Advisory Committee, entitled "Science, Government, and Information," noted the work of the Exchange and recommended its continued activity on a stronger and broader base. The expanded scope in physical sciences and the increasing participation by Federal and non-Government agencies, as noted above, are well underway.

The Federal Council for Science and Technology has agreed that on July 1, 1963, the National Science Foundation will undertake the responsibility for the support of the Exchange through contractual arrangements for its continued operation by the Smithsonian Institution. Government-wide interests will be served by an advisory board of representatives from each of the participating Federal agencies.

SMITHSONIAN MUSEUM SERVICE

The Smithsonian Museum Service, through appropriate educational media, interprets to museum visitors and to the general public the objects, specimens, and exhibits in the several Smithsonian museums and develops interpretative and educational material relating to the work of the Institution in the fields of science, natural history, art, and history. The Museum Service also cooperates with the volunteers of the Junior League of Washington, D.C., who conduct the Junior League Guided Tour Program at the Smithsonian. A more complete report of this activity, directed by G. Carroll Lindsay, curator, is carried in the Report on the U.S. National Museum (pp. 59-60).

The Museum Service provided assistance to professional groups and individuals visiting the museums of the Institution or planning to do so. Assistance in the form of lectures, answers to inquiries, and special tours of certain museum areas was rendered to college and uni-

versity groups visiting the Institution and to other groups and individuals from the United States and abroad, visiting or planning to visit the Smithsonian in a professional capacity. Mr. Lindsay served as consultant on museum organization and practices to representatives from other museums on several occasions.

The Audioguide or radio lecture system in the Museum of Natural History was expanded to include two additional exhibit halls: Life in the Sea, and Dinosaurs and Other Fossil Reptiles. A total of 37 Audioguide lectures are now available in the Museum of Natural History.

During the year Mrs. Linda S. Gordon joined the Museum Service staff as museum technician in zoology and Mrs. Marjorie M. Halpin as museum technician in anthropology. Mrs. Gordon and Mrs. Halpin serve as docents and carry on related work to improve the Museum Service program of interpreting the museum exhibits to the visitor.

The assistant curator, Mrs. Sophy Burnham, wrote, produced, and directed a 16-mm. color motion picture which depicts the construction of the life-size model of the great blue whale exhibited in the new Hall of Life in the Sea. Mrs. Burnham, in cooperation with the various subject specialists involved, also continued her work in the preparation of the Audioguide lectures.

Special "touch" tours for several groups of blind students were arranged during the year. Specimens and objects from the reference collections as well as selected portions of the public exhibits are included in the programs arranged for blind persons.

One-page guide maps which provide floor plans and brief summaries of the exhibits shown in the Museum of Natural History and in the Arts and Industries Building were prepared. These proved most useful in visitor orientation and in answering written inquiries regarding the exhibits in these buildings.

The Museum Service continued to assist radio and television producers wishing to feature Smithsonian exhibits and scientific work. In addition to several local radio and television productions based on various aspects of Smithsonian activity, two half-hour programs featuring the transportation collections were broadcast on a national television network.

The Museum Service again conducted, in cooperation with the University of Maryland, a 5-day workshop on the educational resources of the Institution. This workshop is designed to acquaint graduate students in education with the broad scientific and cultural resources of the Smithsonian of value in school curricula.

The program carried out in cooperation with the Urban Service Corps under the direction of Mrs. Arthur Goldberg proved successful. Local junior high school students were provided with lectures

and tours of museum exhibits designed to increase their knowledge of the exhibits and work of the Institution.

More than 400 35-mm. slides of objects, specimens, and exhibits in the various museums were accessioned, cataloged, and added to the slide library. Slides from this library were used extensively by the Smithsonian staff and by borrowers from the United States, Canada, and Europe.

The Museum Service made arrangements for various Smithsonian public functions and events, including films, lectures, and the opening of new halls and exhibits. Mailing lists for announcements of these events were maintained and kept current.

The Smithsonian Calendar of Events, a listing of special events of the Institution, was prepared and distributed monthly.

The curator attended the following conferences and gatherings: The Southeastern Museums Conference in Richmond, Va.; the Conference of the Society of Architectural Historians in Baltimore, Md.; Annual Winterthur Seminar on Museum Operation and Connoisseurship at Winterthur, Del.; the Museum Store Association Annual Meeting, Minneapolis, Minn.; and the opening of the Mellon Collection of British Paintings, Virginia State Museum of Fine Arts. He also attended and gave a slide lecture to the National Trust Conference for Historic Museum Associates, held at Woodlawn Plantation, Va., and participated in a panel discussion at the convention in Denver, Colo., of the Department of Audiovisual Education, National Education Association.

The curator and the assistant curator traveled to Cambridge, Mass., to speak to the staff of the Smithsonian Astrophysical Observatory on the work and history of the Smithsonian Institution and to view operations there. They also visited museums in the Boston area.

The assistant curator traveled to Baltimore, Md., to view facilities of five museums.

Report of the Executive Committee of the Board of Regents of the Smithsonian Institution

For the Year Ended June 30, 1963

To the Board of Regents of the Smithsonian Institution:

Your executive committee respectfully submits the following report in relation to the funds of the Smithsonian Institution, together with a statement of the appropriations by Congress for the Government bureaus in the administrative charge of the Institution.

SMITHSONIAN INSTITUTION

PARENT FUND

The original bequest of James Smithson was £104,960 8s 6d—\$508,318.46. Refunds of money expended in prosecution of the claim, freight, insurance, and other incidental expenses, together with payment into the fund of the sum of £5,015, which had been withheld during the lifetime of Madame de la Batut, brought the fund to the amount of \$550,000.

The gift of James Smithson was "lent to the United States Treasury, at 6 per centum per annum interest" (20 USC 54), and by the Act of March 12, 1894 (20 USC 55), the Secretary of the Treasury was "authorized to receive into the Treasury, on the same terms as the original bequest of James Smithson, such sums as the Regents may from time to time see fit to deposit, not exceeding, with the original bequest, the sum of \$1,000,000."

The maximum of \$1,000,000 which the Smithsonian Institution was authorized to deposit in the Treasury of the United States was reached on January 11, 1917, by the deposit of \$2,000.

Under the above authority the amounts shown below are deposited in the United States Treasury and draw 6 percent interest:

	<i>Unrestricted funds</i>	<i>Income 1963</i>
James Smithson-----	\$727, 640	\$43, 658. 40
Avery -----	14, 000	840. 00
Habel -----	500	30. 00
Hamilton -----	2, 500	150. 00
Hodgkins (General)-----	116, 000	6, 960. 00
Poore -----	26, 670	1, 600. 20
Rhees -----	590	35. 40
Sanford -----	1, 100	66. 00
	<hr/>	<hr/>
Total -----	\$889, 000	53, 340. 00
		<hr/>
		261

and tours of museum exhibits designed to increase their knowledge of the exhibits and work of the Institution.

More than 400 35-mm. slides of objects, specimens, and exhibits in the various museums were accessioned, cataloged, and added to the slide library. Slides from this library were used extensively by the Smithsonian staff and by borrowers from the United States, Canada, and Europe.

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Rhees	590	35. 40
Sanford	1, 100	66. 00
	<hr/>	<hr/>
Total	\$889, 000	53, 340. 00
		<hr/>
		261

	<i>Restricted funds</i>	<i>Income 1963</i>
Hodgkins (Specific).....	100,000	6,000.00
Reid	11,000	660.00
Total	111,000	6,660.00
Grand total.....	1,000,000	60,000.00

In addition to the \$1,000,000 deposited in the Treasury of the United States there has been accumulated from income and bequests the sum of \$4,489,870.56 which has been invested. Of this sum, \$4,254,290.71 is carried on the books of the Institution as the Consolidated Fund, a policy approved by the Regents at their meeting on December 14, 1916. The balance is made up of several small funds.

CONSOLIDATED FUND

(Income for the unrestricted use of the Institution)

Fund	Investment 1963	Income 1963
Abbott, W. L., Special.....	\$23,595.27	\$1,195.47
Avery, Robert S. and Lydia*.....	62,556.92	3,169.51
Gifts, royalties, gain on sale of securities.....	437,288.17	22,155.81
Hachenberg, George P. and Caroline.....	6,369.45	322.73
Hamilton, James*.....	639.29	32.38
Hart, Gustavus E.....	771.40	39.07
Henry, Caroline.....	1,915.42	97.03
Henry, Joseph and Harriet A.....	77,636.17	3,933.55
Higbee, Harry, Memorial Fund.....	18,918.26	713.50
Hodgkins, Thomas G. (General)*.....	47,975.50	2,430.75
Morrow, Dwight W.....	122,469.22	6,205.05
Olmsted, Helen A.....	1,269.73	64.33
Poore, Lucy T. and George W.*.....	257,760.56	13,059.81
Porter, Henry Kirke.....	453,575.46	22,980.99
Rhees, William Jones*.....	749.28	37.95
Sanford, George N.*.....	1,409.80	71.45
Smithson, James*.....	1,933.47	97.99
Taggart, Gansen.....	566.45	28.72
Witherspoon, Thomas A.....	204,383.08	10,355.33
Total.....	1,721,782.90	86,991.42

*In addition to funds deposited in the United States Treasury.

CONSOLIDATED FUND
(Income restricted to specific use)

Fund	Investment 1963	Income 1963
Abbott, William L., for investigations in biology----	\$165, 109. 55	\$\$, 365. 46
Armstrong, Edwin James, for use of Department of Invertebrate Paleontology when principal amounts to \$5,000-----	2, 089. 87	100. 80
Arthur, James, for investigations and study of the sun and annual lecture on same-----	63, 339. 47	3, 209. 16
Bacon, Virginia Purdy, for traveling scholarship to investigate fauna of countries other than the United States-----	79, 347. 09	4, 020. 23
Baird, Lucy H., for creating a memorial to Secretary Baird-----	58, 066. 07	2, 930. 34
Barney, Alice Pike, for collection of paintings and pastels and for encouragement of American artistic endeavor-----	45, 424. 49	2, 301. 50
Barstow, Frederick D., for purchase of animals for Zoological Park-----	1, 583. 31	80. 21
Brown, Roland W., endowment fund for study, care, and improvement of the Smithsonian paleobotan- ical collections-----	51, 587. 95	1, 769. 32
Canfield collection, for increase and care of the Canfield collection of minerals-----	60, 573. 77	3, 069. 03
Casey, Thomas L., for maintenance of the Casey collection and promotion of researches relating to Coleoptera-----	19, 851. 46	1, 005. 81
Chamberlain, Francis Lea, for increase and promo- tion of Isaac Lea collection of gems and mollusks--	44, 599. 17	2, 259. 67
Dykes, Charles, for support in financial research---	68, 185. 96	3, 454. 71
Eickemeyer, Florence Brevoort, for preservation and exhibition of the photographic collection of Rudolph Eickemeyer, Jr-----	17, 214. 51	872. 21
Hanson, Martin Gustav and Caroline Runice, for some scientific work of the Institution, preferably in chemistry or medicine-----	14, 079. 36	713. 34
Higbee, Harry, income for general use of the Smithsonian Institution after June 11, 1967-----	75. 40	2. 60
Hillyer, Virgil, for increase and care of Virgil Hillyer collection of lighting objects-----	10, 408. 64	527. 35
Hitchcock, Albert S., for care of the Hitchcock Agrostological Library-----	2, 499. 05	126. 60
Hrdlička, Aleš and Marie, to further researches in physical anthropology and publication in con- nection therewith-----	83, 754. 55	4, 038. 91
Hughes, Bruce, to found Hughes alcove-----	30, 315. 09	1, 535. 92
Johnson, E. R. Fenimore, research in underwater photography-----	11, 608. 94	559. 84
Loeb, Morris, for furtherance of knowledge in the exact sciences-----	138, 028. 26	6, 993. 40

CONSOLIDATED FUND—Continued

Fund	Investment 1963	Income 1963
Long, Annette and Edith C., for upkeep and preservation of Long collection of embroideries, laces, and textiles.....	\$859. 93	\$43. 58
Maxwell, Mary E., for care and exhibition of Maxwell collection.....	31, 063. 94	1, 573. 88
Myer, Catherine Walden, for purchase of first-class works of art for use and benefit of the National Collection of Fine Arts.....	31, 990. 18	1, 620. 85
Nelson, Edward W., for support of biological studies.....	35, 220. 43	1, 784. 50
Noyes, Frank B., for use in connection with the collection of dolls placed in the U.S. National Museum through the interest of Mr. and Mrs. Noyes.....	1, 521. 54	77. 07
Pell, Cornelia Livingston, for maintenance of Alfred Duane Pell collection.....	11, 739. 42	594. 76
Petrocelli, Joseph, for the care of the Petrocelli collection of photographic prints and for the enlargement and development of the section of photography of the U.S. National Museum.....	11, 740. 81	594. 87
Rathbun, Richard, for use of division of U.S. National Museum containing Crustacea.....	16, 844. 71	853. 47
Reid, Addison T., for founding chair in biology, in memory of Asher Tunis*.....	28, 170. 38	1, 427. 32
Roebbling Collection, for care, improvement, and increase of Roebbling collection of minerals.....	191, 139. 84	9, 684. 34
Roebbling Solar Research.....	39, 714. 73	2, 012. 21
Rollins, Miriam and William, for investigations in physics and chemistry.....	231, 028. 56	11, 416. 13
Smithsonian employees' retirement.....	36, 863. 17	1, 869. 30
Springer, Frank, for care and increase of the Springer collection and library.....	28, 401. 10	1, 439. 00
Strong, Julia D., for benefit of the National Collection of Fine Arts.....	15, 835. 07	802. 31
Walcott, Charles D. and Mary Vaux, for development of geological and paleontological studies and publishing results of same.....	759, 454. 03	38, 440. 22
Walcott, Mary Vaux, for publications in botany.....	91, 675. 71	4, 644. 87
Younger, Helen Walcott, held in trust.....	117, 024. 81	6, 201. 46
Zerbee, Francis Brinckle, for endowment of aquaria.....	1, 502. 30	76. 12
Total.....	2, 649, 532. 62	133, 092. 67

*In addition to funds deposited in the United States Treasury.

FREER GALLERY OF ART FUND

Early in 1906, by deed of gift, Charles L. Freer, of Detroit, gave to the Institution his collection of Chinese and other Oriental objects of art, as well as paintings, etchings, and other works of art by Whistler, Thayer, Dewing, and other artists. Later he also gave funds for construction of a building to house the collection, and finally in his will, probated November 6, 1919, he provided stocks and securities to the estimated value of \$1,958,591.42, as an endowment fund for the operation of the Gallery. The fund now amounts to \$10,596,154.61.

SUMMARY OF ENDOWMENTS

Invested endowment for general purposes.....	\$2, 610, 782. 90
Invested endowment for specific purposes other than Freer endowment	2, 879, 087. 56
<hr/>	<hr/>
Total invested endowment other than Freer.....	5, 489, 870. 46
Freer invested endowment for specific purposes.....	10, 596, 154. 61
Total invested endowment for all purposes.....	16, 086, 025. 07

CLASSIFICATION OF INVESTMENTS

Deposited in the U.S. Treasury at 6 percent per annum, as authorized in the U.S. Revised Statutes, sec. 5591.....	\$1, 000, 000. 00
Investments other than Freer endowment (cost or market value at date acquired):	
Bonds	\$1, 640, 161. 47
Stocks.....	2, 721, 044. 83
Real estate and mortgages.....	115, 006. 00
Uninvested capital.....	13, 658. 66
<hr/>	<hr/>
Total investments other than Freer endowment.....	4, 489, 870. 46
Investments of Freer endowment (cost or market value at date acquired):	
Bonds	\$5, 480, 542. 36
Stocks	5, 114, 287. 57
Uninvested capital.....	1, 324. 68
<hr/>	<hr/>
Total investments.....	16, 086, 025. 07

EXHIBIT A

BALANCE SHEET OF PRIVATE FUNDS

June 30, 1963

ASSETS

Current funds:

General:

Cash:

United States Treasury current account.....	\$920,365.77
In banks and on hand.....	531,701.82

1,452,067.59

Travel and other advances.....	22,126.88
--------------------------------	-----------

Total general funds.....	1,474,194.47
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Restricted:

Cash—United States Treasury current account.....	\$3,340,087.03
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Investments—stocks and bonds (quoted market value \$1,622,254.85).....	1,634,613.56
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Total restricted funds.....	4,974,700.59
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Total current funds.....	6,448,895.06
--------------------------	--------------

Endowment funds and funds functioning as endowment:

Investments:

Freer Gallery of Art:

Cash.....	\$1,324.68
-----------	------------

Stocks and bonds (quoted market value \$15,687,715.55).....	10,594,829.93
--	---------------

10,596,154.61

Consolidated:

Cash.....	\$13,322.98
-----------	-------------

Stocks and bonds (quoted market value \$5,619,651.94).....	4,240,967.73
--	--------------

4,254,290.71

Loan to United States

Treasury.....	1,000,000.00
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Other stocks and bonds

(quoted market value \$168,188.86).....	120,238.07
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Cash.....	335.68
-----------	--------

Real estate at book value....	115,006.00	5,489,870.46
-------------------------------	------------	--------------

Total endowment funds and funds functioning as endow- ment.....	16,086,025.07
--	---------------

22,534,920.13

EXHIBIT A—Continued

FUND BALANCES

Current funds:		
General:		
Unexpended funds—unrestricted.....		\$1, 474, 194. 47
Total general funds.....		1, 474, 194. 47
Restricted (Exhibit C):		
Unexpended income from endowment.....	\$1, 384, 769. 95	
Funds for special purposes (gifts, grants, etc.).....	3, 589, 930. 64	
Total restricted funds.....		4, 974, 700. 59
Total current funds.....		6, 448, 895. 06
Endowment funds and funds functioning as endowment (Exhibit D):		
Freer Gallery of Art.....	\$10, 596, 154. 61	
Other:		
Restricted.....	\$2, 879, 087. 56	
General.....	2, 610, 782. 90	5, 489, 870. 46
Total endowment funds and funds functioning as endow- ment.....		16, 086, 025. 07
Total.....		22, 534, 920. 13

EXHIBIT B

PRIVATE FUNDS

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS
AND CHANGES IN CURRENT GENERAL FUND BALANCES

Year ended June 30, 1963

	Operations	Publications	Gifts and grants
Current receipts:			
Endowment income:			
Freer Gallery of Art.....	\$440, 732. 83		
Other restricted funds.....	56, 742. 24		
Unrestricted.....	139, 974. 67		
Investment income.....	69, 209. 35		
Gifts and grants, including admin- istrative overhead.....	128, 812. 83		\$6, 854, 937. 05
Publications and photographs.....		\$91, 292. 43	
Miscellaneous.....	9, 372. 45		
Total current receipts.....	844, 844. 37	91, 292. 43	6, 854, 937. 05

EXHIBIT A

BALANCE SHEET OF PRIVATE FUNDS

June 30, 1963

ASSETS

Current funds:

General:

Cash:

United States Treasury current account.....	\$920,365.77
In banks and on hand.....	531,701.82

Travel and other advances.....	1,452,067.59
	22,126.88

Total general funds.....	1,474,194.47
--------------------------	--------------

Restricted:

Cash—United States Treasury current account.....	\$3,340,087.03
---	----------------

Investments—stocks and bonds (quoted market value \$1,622,254.85).....	1,634,613.56
---	--------------

Total restricted funds.....	4,974,700.59
-----------------------------	--------------

Total current funds.....	6,448,895.06
--------------------------	--------------

Endowment funds and funds functioning as endowment:

Investments:

Freer Gallery of Art:

Cash.....	\$1,324.68
-----------	------------

Stocks and bonds (quoted market value \$15,687,715.55).....	10,594,829.93
--	---------------

	10,596,154.61
--	---------------

Consolidated:

Cash.....	\$13,322.98
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Stocks and bonds (quoted market value \$5,619,651.94).....	4,240,967.73
--	--------------

	4,254,290.71
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Loan to United States Treasury.....	1,000,000.00
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Other stocks and bonds (quoted market value \$168,188.86).....	120,238.07
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Cash.....	335.68
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Real estate at book value....	115,006.00	5,489,870.46
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Total endowment funds and funds functioning as endow- ment.....	16,086,025.07
--	---------------

	22,534,920.13
--	---------------

EXHIBIT A—Continued

FUND BALANCES

Current funds:		
General:		
Unexpended funds—unrestricted.....		\$1, 474, 194. 47
Total general funds.....		1, 474, 194. 47
Restricted (Exhibit C):		
Unexpended income from endowment.....	\$1, 384, 769. 95	
Funds for special purposes (gifts, grants, etc.).....	3, 589, 930. 64	
Total restricted funds.....		4, 974, 700. 59
Total current funds.....		6, 448, 895. 06
Endowment funds and funds functioning as endowment (Exhibit D):		
Freer Gallery of Art.....	\$10, 596, 154. 61	
Other:		
Restricted.....	\$2, 879, 087. 56	
General.....	2, 610, 782. 90	5, 489, 870. 46
Total endowment funds and funds functioning as endow- ment.....		16, 086, 025. 07
Total.....		22, 534, 920. 13

EXHIBIT B

PRIVATE FUNDS

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS
AND CHANGES IN CURRENT GENERAL FUND BALANCES

Year ended June 30, 1963

	Operations	Publications	Gifts and grants
Current receipts:			
Endowment income:			
Freer Gallery of Art.....	\$440, 732. 83		
Other restricted funds.....	56, 742. 24		
Unrestricted.....	139, 974. 67		
Investment income.....	69, 209. 35		
Gifts and grants, including admin- istrative overhead.....	128, 812. 83		\$6, 854, 937. 05
Publications and photographs.....		\$91, 292. 43	
Miscellaneous.....	9, 372. 45		
Total current receipts.....	844, 844. 37	91, 292. 43	6, 854, 937. 05

EXHIBIT B—Continued

PRIVATE FUNDS—Continued

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS
AND CHANGES IN CURRENT GENERAL FUND BALANCES—Continued

Year ended June 30, 1963

	Operations	Publications	Gifts and grants
Current expenditures:			
Salaries:			
Administrative.....	\$118, 210. 85	-----	-----
Research.....	17, 629. 76	-----	\$3, 081, 622. 19
Other.....	220, 979. 97	-----	-----
Total salaries.....	356, 820. 58	-----	3, 081, 622. 19
Purchase for collection.....	117, 772. 13	-----	-----
Researches and exploration and related administrative expenses:			
Travel.....	18, 666. 44	-----	-----
Equipment and supply.....	8, 437. 20	-----	-----
Other.....	5, 460. 40	-----	3, 773, 314. 86
Publication and photographs.....	38, 726. 56	49, 231. 30	-----
Buildings, equipment and grounds:			
Buildings and installations.....	17, 872. 25	-----	-----
Court and grounds maintenance.....	946. 77	-----	-----
Technical laboratory.....	1, 958. 97	-----	-----
Contractual services—custodian and legal fees.....	22, 203. 30	-----	-----
Supplies and expenses:			
Meetings, special exhibits.....	16, 846. 36	-----	-----
Lectures.....	2, 637. 41	-----	-----
Photographs and reproductions.....	5, 148. 12	-----	-----
Library.....	4, 571. 27	-----	-----
Sales desk.....	9, 443. 07	-----	-----
Stationery and office supplies.....	96. 50	-----	-----
Postage, telephone, and telegraph.....	89. 35	-----	-----
Employees' withholding payments, net.....	(1, 582. 99)	-----	-----
Total current expenditures.....	626, 113. 69	49, 231. 30	6, 854, 937. 05
Excess of current receipts over current expenditures.....	\$218, 730. 68	42, 061. 13	\$260, 791. 81
Balance at beginning of year.....	-----	-----	1, 213, 402. 66
Balance at end of year.....	-----	-----	1, 474, 194. 47

EXHIBIT C

PRIVATE FUNDS

STATEMENT OF CHANGES IN CURRENT RESTRICTED FUND BALANCE

Year ended June 30, 1963

	Unexpended income	Funds for special purposes (gifts, grants etc.)	Total
Balance at beginning of year	\$1, 210, 899. 50	\$2, 993, 960. 51	\$4, 204, 860. 01
Add:			
Income from restricted endow- ment:			
Freer Gallery of Art	496, 274. 53	-----	496, 274. 53
Other restricted funds	281, 941. 04	-----	281, 941. 04
	778, 215. 57	-----	778, 215. 57
Less custodial costs	34, 766. 08	-----	34, 766. 08
Net income from restricted endowment	743, 449. 49	-----	743, 449. 49
Sale of publications	30, 028. 25	1, 091. 17	31, 119. 42
Gifts and grants	-----	7, 062, 356. 85	7, 062, 356. 85
Other	17, 626. 04	450, 644. 31	468, 270. 35
	2, 002, 003. 28	10, 508, 052. 84	12, 510, 056. 12
Deduct:			
Transfer to current income, net of custodial cost:			
Freer Gallery of Art	407, 462. 20	-----	407, 462. 20
Other restricted funds	55, 246. 79	6, 854, 937. 05	6, 910, 183. 84
Unrestricted	139, 974. 67	-----	139, 974. 67
	602, 683. 66	6, 854, 937. 05	7, 457, 620. 71
Transfer	-----	66, 185. 15	66, 185. 15
Income added to principal, net	11, 549. 67	-----	11, 549. 67
Transfer to (from) gifts and grants	3, 000. 00	(3, 000. 00)	-----
	617, 233. 33	6, 918, 122. 20	7, 535, 355. 53
Balance at end of year	1, 384, 769. 95	3, 589, 930. 64	4, 974, 700. 59

EXHIBIT D

PRIVATE FUNDS

STATEMENT OF CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS AND FUNDS
FUNCTIONING AS ENDOWMENT

Year ended June 30, 1963

Balance at beginning of year.....		\$15, 236, 651. 39
Add:		
Gifts and bequests.....	\$126, 799. 50	
Income added to principal as prescribed by donor.....	11, 549. 67	
Proceeds from sale of Table Mountain installations.....	12, 000. 00	
Net gain on investments.....	699, 024. 51	849, 373. 68
		<hr/>
		16, 086, 025. 07
Balance at year end consisting of:		
Unrestricted.....	2, 610, 782. 90	
Restricted for:		
Freer Gallery of Art.....	10, 596, 154. 61	
Other collections and research.....	2, 879, 087. 56	
	<hr/>	
	16, 086, 025. 07	

The practice of maintaining savings accounts in several of the Washington banks and trust companies has been continued during the past year, and interest on these deposits amounted to \$12,764.30.

Deposits are made in banks for convenience in collection of checks, and later such funds are withdrawn and deposited in the United States Treasury. Disbursement of funds is made by check signed by the Secretary of the Institution and drawn on the United States Treasury.

The Institution gratefully acknowledges gifts and grants from the following:

Academic Press, a gift to the Rathbun Fund.

American Chiclé Co., a contribution for the improvement of the United States National Herbarium collection.

American Philosophical Society:

Grant for the support of research entitled "Life History and Taxonomic Studies of the Water Beetles of Puerto Rico and the Virgin Islands."

Grant for the entomological collecting and research in British West Indies.

Grant for the entomological collecting and research in Mexico.

Anniston Public Library, a gift to prepare a scientific evaluation of a collection of birds.

Appalachian Power Co., additional grant for archeological surveys in the Smith Mountain Reservoir on the Roanoke River.

Atomic Energy Commission, additional grant for support of research entitled "A Study of the Biochemical Effects of Ionizing and Nonionizing Radiation of Plant Metabolism during Development."

Lucy H. Baird, in settlement of bequest.

Bredin Foundation:

Grant for research entitled "Ocean Food Chain Cycle."

Grant for research entitled "Biological Survey of Dominica Project."

Roland W. Brown, a bequest for the care and improvement of the paleobotanical collection.

James Campbell, a contribution to the Zoo Animal Fund.

De Beer Consolidated Mines, Ltd., a gift to defray expenses in exhibiting the Hope Diamond in France.

Department of Air Force:

Additional grant for research directed toward the study of stellar scintillation.

Additional grant for upper atmosphere image study.

Additional grant for research directed toward the studies of rate of accretion of interplanetary matter by the earth.

Additional grant for the study of atmospheric entry and impact of high velocity meteorites.

Department of the Army:

Grant for the support of research entitled "Mammals and Their Ectoparasites from Iran."

Grant for support of research entitled "Potential Vectors and Reservoirs of Disease in Strategic Overseas Area."

Grant for support of research on the analysis of bird migration in the Pacific area and the study of ecology of birds and mammals on one or more Pacific islands.

Department of Interior, a grant for service on the taxonomy of Peruvian fishes.

Eistophas Science Club, a contribution to the Zoo Animal Fund.

Fashion Group of Washington, a gift to the Historic Dress Fund.

Ford Foundation:

Grant for the support of the preparation of an up-to-date history of the United States Flag over a 3-year period.

A gift to the Freer Gallery of Art for the publication and distribution of an illustrated scholarly catalogue of the collection of Armenian manuscripts.

General Atomic Division, a donation to the Meteorite Fund.

General Motors Corp., a gift for the construction of two dielectric locomotive models.

Esther Goddard, a gift to help struggling scientists.

Graham Foundation, a gift to the Smithsonian Traveling Exhibition Service for the Alvar Aalto Exhibition.

Ethel R. Holmes:

Gift to the Milton A. Holmes Memorial Numismatics Fund.

Gift to the Milton A. Holmes Memorial Philately Fund.

Institute of International Education, a contribution for matters pertaining to International Exchange program.

Edwin A. Link, a gift to the Marine Archeology Fund.

Link Foundation:

Grant for the 1963 Edwin A. Link Lecture.

Grant for the publication of "Famous Firsts of Space Flight."

For support to the James Means Memorial Fund:

Cabot Foundation

Ward M. Canady Educational and Charitable Trust Co.

Ward M. and Marian C. Canady Trust Co.

Ellen Loomis

Edward Mallinckrodt, Jr.

Paul Mellon and Kaufmann Charitable Foundation, a gift to the Smithsonian Traveling Exhibition Service.

Miami University, a grant for the preserving of the collection of herbaceous stems in Panama.

Museum of France, a contribution toward exhibition of the Hope Diamond.

National Aeronautics and Space Administration:

Additional grant for support of research entitled "The Motion of Artificial Satellites."

Additional grant for the scientific and engineering study for instrumenting an orbiting telescope.

Additional grant for research entitled "Optical Satellite Tracking Program."

Grant for the systematic recovery of meteorites and the photography of meteorites in flight.

Grant for consultant services to be provided to the California Museum of Science and Industry.

National Institutes of Health:

Additional grant for support of research entitled "Studies of Asian Biting Flies."

Grant for support of research entitled "Anthropology of Chronic Disease in Relation to Social Efficiency."

Grant for support of research entitled "Chronic Diseases in Relation to Social Efficiency."

National Science Foundation:

Grant for the support of research entitled "Tertiary Forests of the Tonasi-Santiago Basin of Panama."

Grant for the support of research entitled "Systematic Significance of Schinoid Spines."

Grant for the support of research entitled "Phanerogams of Colombia."

Grant for the support of research entitled "Systematic and Distribution of North American Calanoid and Harpacticoid Copepoda."

Grant for the support of research entitled "Ecology and Behavior of *Suncus murinus*."

Grant for the support of research entitled "Photoresponses and Optical Properties of *Phycomyces* Sporangioophores."

Grant for the support of research entitled "Taxonomy of Bamboos."

Grant for the support of research entitled "Lower Cretaceous Ostracoda of Israel."

Grant for the support of research entitled "Marine Mollusks of Polynesia."

Grant for the support of research entitled "Tertiary Echinoids of the Eastern United States and the Caribbean."

Grant for the support of research entitled "Monographic Revision of Carcharinid Sharks of the Tropical Indo-Pacific Oceans."

Grant for the support of research entitled "Zoogeography of Southern Ocean Scleractinian Coral Faunas."

Grant for the support of research entitled "Magalithic Structures of Nan Mandol, Ponape."

Grant for the support of research entitled "Frogs of Western Brazil and of Colombia."

Grant for the support of research entitled "Prehistory of Southwest Virginia."

National Science Foundation—Continued

- Grant for the support of research entitled "Indo-Australian Vespidae sens. lat. and Sphecidae."
- Grant for the support of research entitled "Publication of an English Translation of Flora of Japan, by Jisaburo Ohwi."
- Grant for the support of research entitled "An Archeological Investigation of the Key School Site, Georgia."
- Grant for the support of research entitled "Collection of Meteorites and Tektites in Australia."
- Grant for the support of research entitled "Revision of the Genera of Paleozoic Bryozoa."
- Grant for the support of research entitled "Oldest Fossil Bryozoa of the United States."
- Grant for the support of research entitled "The Flora of Fiji."
- Grant for the support of research entitled "Mammals of Southeastern United States."
- Grant for the support of research entitled "Permo-Triassic Reptiles of South America."
- Grant for the support of research entitled "South Asian Microlepidoptera, particularly the Philippine Series."
- Grant for the support of research entitled "The Mammals of Panama."
- Grant for the support of research entitled "Scientific Community in England 1820-1860."
- Grant for the support of research entitled "Shanidar IV-VI Neanderthals."
- Grant for the support of research entitled "European Tertiary Dicotyledon Floras."
- Grant for the support of research entitled "Revision of the Beetles of the Genus *Neobrotica* Jacoby."
- Grant for the support of research entitled "The American Commensal Crabs of the Family Pinnotheridae."
- Northwest Federation of Mineralogical Societies, a gift for lectures given by Dr. Paul E. Desautel in Portland and Spokane.
- Office of Naval Research:
- Additional grant to provide advisory and consultant services.
 - Additional grant to perform psychological research studies.
 - Additional grant for research of information of shark distribution and distribution of shark attack all over the world.
 - Additional grant for studies concerning the development of a proposal for an institute for laboratory of human performance standards.
 - Additional grant for support of research entitled "Microlepidoptera of the Island of Rapa."
 - Additional grant for support of research entitled "A Study of Anatomy and Taxonomy of Hawaiian Woods."
 - Additional grant to perform aeronautical research studies.
 - Additional grant for the purpose of conducting systematic zoological research on the marine fauna of Tropical Pacific Area.
 - Additional grant for research and development task order.
- B. T. Rocca, Sr., donation for the purchase of crystal tourmaline from Brazil.
- Rockefeller Foundation, grant for the support of research entitled "Cooperative Field Studies of Relationship of Birds to Arthropod-transmitted Virus Disease in the Region of Braganca, Brazil."
- Frank R. Schwengel, a gift toward the study of mollusks of Polynesia.

For support of Science Information Exchange:

Atomic Energy Commission
 Department of Defense
 Federal Aviation Agency
 National Aeronautics and Space Administration
 National Institutes of Health
 National Science Foundation
 Veterans Administration

Social Science Research Council, a gift for the conference on Transcultural Studies of Cognitive System in Mérida, Mexico.

Theodore Szybowicz, a contribution toward the Moonwatch Study.

Tucson Gem and Mineral Society, grant for the inspection of an exhibit of gems and minerals.

The United Educators, Inc., a gift for the use by the National Air Museum for reference materials.

UNESCO, a gift to defray costs on UNESCO Visiting Committee for Tropical Herbaria.

University of Hawaii, a gift for research on mollusks at Eniwetok, Marshall Islands.

University of Michigan, a gift to defray costs on publication of *Ars Orientalis*.

Ellen Bayard Weeden Foundation, a gift for the Freer Gallery of Arts Library Fund.

Wilmington Society of Fine Arts, a contribution to the Smithsonian Traveling Exhibition Service.

Woods Hole Oceanographic Institution:

Additional grant for the study of plankton collections.

Grant for the Indian Ocean Expedition training program in Bermuda.

Gift to provide funds to permit the participation in the International Indian Ocean Expedition.

Charles M. Wormser, a gift to provide acquisitions for the division of numismatics.

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1963:

Salaries and expenses.....	\$11,060,550.00
National Zoological Park.....	1,504,997.00
The appropriation made to the National Gallery of Art (which is a bureau of the Smithsonian Institution) was.....	2,113,850.00

In addition, funds were transferred from other Government agencies for expenditure under the direction of the Smithsonian Institution as follows:

Working funds, transferred from the National Park Service Interior Department, for archeological investigations in river basins throughout the United States.....	\$271,000.00
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The Institution also administers a trust fund for partial support of the Canal Zone Biological Area, located on Barro Colorado Island in the Canal Zone.

AUDIT

The report of the audit of the Smithsonian Private Funds follows:

THE BOARD OF REGENTS,
Smithsonian Institution
Washington, D.C., 20560

We have examined the balance sheet of private funds of Smithsonian Institution as of June 30, 1963, and the related statement of current general private funds receipts and disbursements and the several statements of changes in funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Land, building, furniture, equipment, works of art, living and other specimens and certain sundry property are not included in the accounts of the Institution; likewise, the accompanying statements do not include the National Gallery of Art, the National Cultural Center and other departments, bureaus and operations administered by the Institution under Federal appropriations. The accounts of the Institution are maintained on the basis of cash receipts and disbursements, with the result that the accompanying statements do not reflect income earned but not collected or expenses incurred but not paid.

In our opinion, subject to the matters referred to in the preceding paragraph, the accompanying statement of private funds presents fairly the assets and funds principal of Smithsonian Institution at June 30, 1963; further, the accompanying statement of current general private funds receipts and disbursements and several statements of changes in funds, which have been prepared on a basis consistent with that of the preceding year, present fairly the cash transactions of the private funds for the year then ended.

PEAT, MARWICK, MITCHELL & Co.

WASHINGTON, D.C., *August 29, 1963.*

Respectfully submitted.

(S) ROBERT V. FLEMING,
(S) CARYL P. HASKINS,
(S) CLARENCE CANNON,
Executive Committee.

