Smithsonian Institution

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

1961

Smithsonian Institution

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

For the year ended June 30

1961

Smithsonian Publication 4475

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1961

CONTENTS

	Page
List of officials	v
General statement	1
The Establishment	17
The Board of Regents	17
Finances	18
Visitors	18
Reports of branches of the Institution:	
United States National Museum	20
Bureau of American Ethnology	48
Astrophysical Observatory	81
National Collection of Fine Arts	99
Freer Gallery of Art	110
National Air Museum	124
National Zoological Park	133
Canal Zone Biological Area	178
International Exchange Service	183
National Gallery of Art	192
Report on the library	205
Report on publications	209
Other activities:	
Lectures	218
Science Information Exchange	218
Smithsonian Museum Service	219
Report of the executive committee of the Board of Regents	221

THE SMITHSONIAN INSTITUTION

June 30, 1961

Presiding Officer ex officio.—JOHN F. KENNEDY, President of the United States.
Chancellor.—EARL WARREN, Chief Justice of the United States.
Members of the Institution:

JOHN F. KENNEDY, President of the United States.
LYNDON B. JOHNSON, Vice President of the United States.
EARL WARREN, Chief Justice of the United States.
DEAN RUSK, Secretary of State.
DOUGLAS DILLON, Secretary of the Treasury.
ROBERT S. MCNAMARA, Secretary of Defense.
ROBERT F. KENNEDY, Attorney General.
J. EDWARD DAY, Postmaster General.
STEWART L. UDALL, Secretary of the Interior.
ORVILLE L. FREEMAN, Secretary of Agriculture.
LUTHER H. HODGES, Secretary of Commerce.
ARTHUR J. GOLDBERG, Secretary of Labor.
ABRAHAM A. RIBICOFF, Secretary of Health, Education, and Welfare.

Regents of the Institution:

EARL WARREN, Chief Justice of the United States, Chancellor.
LYNDON B. JOHNSON, Vice President of the United States.
CLINTON P. ANDERSON, Member of the Senate.
J. WILLIAM FULBRIGHT, Member of the Senate.
LEVERETT SALTONSTALL, Member of the Senate.
FRANK T. BOW, Member of the House of Representatives.
OVERTON BROOKS, Member of the House of Representatives.
CLARENCE CANNON, Member of the House of Representatives.
JOHN NICHOLAS BROWN, citizen of Rhode Island.
ARTHUR H. COMPTON, citizen of Missouri.
ROBERT V. FLEMING, citizen of Washington, D.C.
CRAWFORD H. GREENEWALT, citizen of Delaware.
CARYL P. HASKINS, citizen of Washington, D.C.
JEROME C. HUNSAKER, citizen of Massachusetts.

Executive Committee.—ROBERT V. FLEMING, *Chairman*, CLARENCE CANNON, CARYL P. HASKINS.
Secretary.—LEONARD CARMICHAEL.
Assistant Secretaries.—A. REMINGTON KELLOGG, JAMES C. BRADLEY.
Assistant to the Secretary.—THEODORE W. TAYLOR.
Administrative assistant to the Secretary.—MRS. LOUISE M. PEARSON.
Treasurer.—EDGAR L. ROY.
Chief, editorial and publications division.—PAUL H. OEHSER.
Librarian.—RUTH E. BLANCHARD.
Curator, Smithsonian Museum Service.—G. CARROLL LINDSEY.
Buildings Manager.—ANDREW F. MICHAELS, JR.
Director of Personnel.—J. A. KENNEDY.
Chief, supply division.—A. W. WILDING.
Chief, photographic service division.—O. H. GREESON.

UNITED STATES NATIONAL MUSEUM

Director.—A. Remington Kellogg.
Registrar.—Helena M. Weiss.

MUSEUM OF NATURAL HISTORY

Director.—A. C. Smith.
Administrative Officer.—Mrs. Mabel A. Byrd.

DEPARTMENT OF ANTHROPOLOGY: T. Dale Stewart, head curator; A. J. Andrews, exhibits specialist.

Division of Archeology: W. R. Wedel, curator; Clifford Evans, Jr., G. W. Van Beek, associate curators.

Division of Ethnology: S. H. Riesenberg, curator; G. D. Gibson, E. I. Knez, associate curators; R. A. Elder, Jr., assistant curator.

Division of Physical Anthropology: T. D. Stewart, acting curator; M. T. Newman, associate curator.

DEPARTMENT OF ZOOLOGY: ~~F. A. Chace, Jr., acting~~ head curator.

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

Division of Birds: H. G. Deignan, curator.

Division of Reptiles and Amphibians: Doris M. Cochran, curator.

Division of Fishes: L. P. Schultz, curator; E. A. Lachner, W. R. Taylor, associate curators.

Division of Insects: J. F. G. Clarke, curator; O. L. Cartwright, R. E. Crabill, Jr., W. D. Field, O. S. Flint, Jr., associate curators.

Division of Marine Invertebrates: F. A. Chace, Jr., curator; F. M. Bayer, T. E. Bowman, C. E. Cutress, Jr., associate curators.

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

DEPARTMENT OF BOTANY (NATIONAL HERBARIUM): J. R. Swallen, head curator.

Division of Phanerogams: L. B. Smith, curator; R. S. Cowan, E. C. Leonard, Velva E. Rudd, J. J. Wurdack, associate curators.

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

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

Division of Cryptogams: M. E. Hale, Jr., associate curator in charge; P. S. Conger, associate curator; R. R. Ireland, Jr., assistant curator.

Division of Woods: W. L. Stern, curator.

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

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

Division of Invertebrate Paleontology and Paleobotany: R. S. Boardman, associate curator in charge; P. M. Kier, Richard Cifelli, E. G. Kauffman, associate curators.

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

MUSEUM OF HISTORY AND TECHNOLOGY

Director.—F. A. Taylor.
Assistant Director.—J. C. Ewers.
Administrative officer.—W. E. Boyle.
Chief exhibits specialist.—J. E. Anglim.

In charge of Taxidermy.—W. M. Perrygo.
Assistant chief exhibits specialists.—B. S. Bory, R. O. Hower, B. W. Lawless, Jr.
DEPARTMENT OF SCIENCE AND TECHNOLOGY: R. P. Multhauf, head curator.
Division of Physical Sciences: R. P. Multhauf, acting curator.
Division of Mechanical and Civil Engineering: R. M. Vogel, curator in charge; E. A. Battison, associate curator.
Division of Transportation: H. I. Chapelle, curator; K. M. Perry, J. H. White, Jr., associate curators.
Division of Electricity: R. P. Multhauf, acting curator.
Division of Medical Sciences: J. B. Blake, curator; S. K. Hamarneh, associate curator.
DEPARTMENT OF ARTS AND MANUFACTURES: P. W. Bishop, head curator.
Division of Textiles: Grace L. Rogers, associate curator in charge.
Division of Ceramics and Glass: P. V. Gardner, associate curator in charge.
Division of Graphic Arts: Jacob Kainen, curator; Eugene Ostroff, F. O. Griffith, associate curators.
Division of Manufactures and Heavy Industries: P. W. Bishop, acting curator; C. O. Houston, Jr., associate curator.
Division of Agriculture and Forest Products: E. C. Kendall, associate curator in charge.
DEPARTMENT OF CIVIL HISTORY: R. H. Howland, head curator; P. C. Welsh, associate curator; Arlene P. Kringold, assistant curator.
Division of Political History: W. E. Washburn, curator; Mrs. Margaret Brown Klapthor, associate curator; Mrs. Anne W. Murray, H. R. Collins, assistant curators.
Division of Cultural History: C. Malcolm Watkins, curator; Rodris C. Roth, associate curator; Cynthia L. Adams, J. N. Pearce, assistant curators; Anthony Hathaway, junior curator.
Division of Philately and Postal History: G. T. Turner, associate curator in charge; F. J. McCall, associate curator; C. H. Scheele, assistant curator.
Division of Numismatics: Vladimir Clain-Stefanelli, associate curator in charge; Mrs. Elvira Clain-Stefanelli, associate 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, associate curator in charge.

BUREAU OF AMERICAN ETHNOLOGY

Director.—F. H. H. Roberts, Jr.
Anthropologist.—H. B. Collins, Jr.
Ethnologists.—W. C. Sturtevant, W. L. Chafe.
RIVER BASIN SURVEYS.—F. H. H. Roberts, Jr., *Director;* R. L. Stephenson, *Chief, Missouri Basin Project.*

ASTROPHYSICAL OBSERVATORY

Director.—F. L. Whipple.
Assistant Director.—C. W. Tillinghast.
Astronomers.—G. A. Bakos, G. Colombo, G. H. Conant, Jr., L. Goldberg, I. G. Izsak, Y. Kozai, K. Lassovszky, J. Slowey, P. E. Zadunaisky.
Mathematicians.—R. E. Briggs, D. A. Lautman.
Physicists.—R. J. Davis, E. L. Fireman, F. Franklin, O. Gingerich, M. Grossi, P. W. Hodge, L. G. Jacchia, M. Krook, R. E. McCrosky, R. B. Riggs, Jr., O. Rustgi, A. Skalafuris, R. B. Southworth, D. Tilles, C. A. Whitney.

Geodesists.—J. Rolff, G. Veis.
Geologist.—J. Wood.
TABLE MOUNTAIN, CALIF., FIELD STATION.—A. G. Froiland, *physicist.*
DIVISION OF RADIATION AND ORGANISMS:
Chief.—W. H. Klein.
Plant physiologists.—J. L. Edwards, V. B. Elstad, L. Loercher, L. Price.
Biophysicist.—W. Shropshire.
Biochemist.—M. Margulies.
Cytogeneticist.—R. L. Latterell.
Electronic Engineer.—J. H. Harrison.
Instrument maker.—D. G. Talbert.

NATIONAL COLLECTION OF FINE ARTS

Director.—T. M. Beggs.
Associate curator.—Rowland Lyon.
SMITHSONIAN TRAVELING EXHIBITION SERVICE.—Mrs. Annemarie H. Pope, *Chief.*

FREER GALLERY OF ART

Director.— A. G. Wenley.
Assistant Director.—J. A. Pope.
Head curator, Near Eastern Art.—Richard Ettinghausen.
Curator, Japanese Art.—H. P. Stern.
Associate curator, Chinese Art.—J. F. Cahill.
Head curator, Laboratory.—R. J. Gettens.

NATIONAL AIR MUSEUM

Advisory Board:
Leonard Carmichael, *Chairman.*
Maj. Gen. Brooke Allen, U.S. Air Force.
Rear Adm. P. D. Stroop, U.S. Navy.
Lt. Gen. James H. Doolittle.
Grover Loening.
Director.—P. S. Hopkins.
Head curator and historian.—P. E. Garber.
Associate curators.—L. S. Casey, W. M. Male, K. E. Newland.
Junior curator.—R. B. Meyer.

NATIONAL ZOOLOGICAL PARK

Director.—T. H. Reed.
Associate Director.— J. L. Grimmer.
Veterinarian.—James F. Wright.

CANAL ZONE BIOLOGICAL AREA

Resident Naturalist.—M. H. Moynihan.

INTERNATIONAL EXCHANGE SERVICE

Chief.—J. A. Collins.

NATIONAL GALLERY OF ART

Trustees:
EARL WARREN, Chief Justice of the United States, *Chairman.*
DEAN RUSK, Secretary of State.
DOUGLAS DILLON, Secretary of the Treasury.
LEONARD CARMICHAEL, Secretary of the Smithsonian Institution.
F. LAMMOT BELIN.

Trustees—Continued
JOHN HAY WHITNEY.
CHESTER DALE.
PAUL MELLON.
RUSH H. KRESS.
President.—CHESTER DALE.
Vice President,—PAUL MELLON.
Secretary-Treasurer.—HUNTINGTON CAIRNS.
Director.— JOHN WALKER.
Administrator.—ERNEST R. FEIDLER.
General Counsel.—HUNTINGTON CAIRNS.
Chief Curator.—PERRY B. COTT.

* * * *

Honorary Research Associates, Collaborators, and Fellows

OFFICE OF THE SECRETARY

John E. Graf

UNITED STATES NATIONAL MUSEUM

MUSEUM OF NATURAL HISTORY

Anthropology

J. M. Campbell, Archeology.
N. M. Judd, Archeology.
H. W. Krieger, Ethnology.
Betty J. Meggers, Archeology.
F. M. Setzler, Anthropology.
H. Morgan Smith, Archeology.
W. W. Taylor, Jr., Archeology.
W. J. Tobin, Physical Anthropology.

Zoology

Doris H. Blake, Insects.
J. Bruce Bredin, Biology.
M. A. Carriker, Insects.
Ailsa M. Clark, Marine Invertebrates.
C. J. Drake, Insects.
Herbert Friedmann, Birds.
D. C. Graham, Biology.
H. H. Hobbs, Jr., Marine Invertebrates.
A. B. Howell, Mammals.
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.
R. E. Snodgrass, Insects.
T. E. Snyder, Insects.
H. K. Townes, Insects.
Alexander Wetmore, Birds.
Mildred S. Wilson, Copepod Crustacea.

Botany

C. R. Benjamin, Fungi.
Agnes Chase, Grasses.
E. P. Killip, Phanerogams.
F. A. McClure, Grasses.
Kittie F. Parker, Phanerogams.
J. A. Stevenson, Fungi.
W. N. Watkins, Woods.

Geology

R. S. Bassler, Paleontology.
R. W. Brown, Paleobotany.
P. E. Cloud, Invertebrate Paleontology.
C. W. Cooke, Invertebrate Paleontology.
W. T. Schaller, Mineralogy.

MUSEUM OF HISTORY AND TECHNOLOGY

Exhibits

W. L. Brown.

History

Mrs. Arthur M. Greenwood, Cultural History.
E. C. Herber, History.
I. N. Hume, Cultural History.
F. W. MacKay, Numismatics.

Science and Technology

Derek J. Price.

Bureau of American Ethnology

J. P. Harrington.
Sister M. Inez Hilger.
M. W. Stirling.
A. J. Waring, Jr.

Astrophysical Observatory

C. G. Abbot.

Freer Gallery of Art

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

National Air Museum

Frederick C. Crawford.
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, 1961

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, 1961.

GENERAL STATEMENT

Just 115 years ago, Joseph Henry presented to the first Board of Regents of the Institution, at their request, a "Program of Organization of the Smithsonian Institution." While this document was being formulated, Henry was still a professor at Princeton and actively engaged in teaching and experimental work in physics. He was a man of broad influence. His eminence in science had already led his contemporaries to describe him as being next to Franklin in the list of great American physical scientists. The program that he outlined for the Smithsonian was so good that he was almost at once offered the position of Secretary of the Institution. After much hesitation he accepted the post and spent the next 32 years skillfully putting into practice and developing the plan that he had evolved.

Today, as we look at Henry's program for the Smithsonian and study the steps that he took to give it reality, we are struck by his wisdom and especially by his foresight. Before writing the basic program, Henry acquainted himself with the life and the attitudes of the distinguished English scientist, James Smithson, whose bequest established the Institution. This study led Henry to place great emphasis on the words Smithson himself had used to describe the objective of his establishment, that it should be "for the increase and diffusion of knowledge among men."

It is almost startling to note, in spite of intervening wars and many social and economic changes, that the constructive activities of the Smithsonian Institution in 1961 can still accurately be subsumed under the headings of the *increase* and *diffusion* of knowledge as directed by Smithson and as made a reality by Joseph Henry.

By means of research publications, popular publications, museum activities, lectures, international exchange of scientific documents, and a voluminous correspondence, the Institution during the current year, as in Henry's time, has effectively diffused knowledge. By investigations in a wide range of fields, the Smithsonian has also continued the research for which it has long been world-famous and that has increased the true sum of human knowledge. It can therefore be said with assurance that the current year has been outstanding in the two main activities which both Smithson and Henry saw as fundamental at the Smithsonian.

Much progress was made during the year on the new buildings that will soon help in a most basic way these great twin objectives. Construction progressed on the additional monumental building of the Institution which when completed will house and display the notable collections of the Smithsonian in the fields of history and technology. The laying of the cornerstone of this building, with appropriate ceremonies, took place on May 19. Work was also begun on the building of the long-needed East Wing of the Natural History Building. Details of these building operations are given on later pages of this report.

Good progress was also made in the continuing gradual renovation of all exhibits now displayed in existing Smithsonian buildings. It may be appropriate and useful to recapitulate here the work that has been completed in this great program since it began some eight years ago, inasmuch as such a summary has not previously been presented in any annual report of the Institution.

1. FOSSIL PLANTS AND INVERTEBRATES

The new Hall of Fossil Plants and Invertebrate Animals shows in a modern series of artistically arranged exhibits the scientific record of the early development of life on this planet. At the very beginning of the hall care is taken to show and explain what a fossil is, what animals and plants have been found as fossils, how animals become entombed in rocks, and how the geologic time scale was formed. A special case displays what may well be the oldest fossil known. Visitors see not only some of the Smithsonian's outstanding fossil preparations but also full-scale reproductions by means of colored models of typical groups of the plants and animals that lived all over the globe in the warm seas of millions of years ago. An exhibit called "Giants of the Past" shows some of the largest known invertebrate fossils. As in all modern Smithsonian exhibits, this hall displays only a small fraction of the total collections of fossil plants and invertebrates that belong to the Institution. Those selected for public display are shown in such a way as to give each visitor a vivid, interesting, and accurate introduction to the basic science of paleontology. The

remaining collections in this, as in all fields, are available for study by qualified students.

2. FOSSIL FISHES AND AMPHIBIANS

The Hall of Fossil Fishes, Amphibians, and Primitive Reptiles displays selections from the Smithsonian's superb collections of these fossil creatures which represent the most primitive groups of backboned animals. Here are many actual skeletons of some of these great ancient animals that ruled the land and the seas before modern animals evolved. This hall portrays in a particularly clear way the development of jaws and the anatomical changes related to the transition from life in water to life on the land. A habitat group illustrates for the visitor what some of these animals were actually like when they ranged the globe. A life-size diorama shows conflict between two kinds of pelycosaurs, or fin-backed reptiles, as might have happened 260 million years ago.

3. PREHISTORIC MAMMALS

In the Hall of the Age of Mammals in North America lifelike dioramas and scientifically accurate and artistically significant murals recreate a mammalian world that existed before modern man appeared. Here are shown skeletons of some of the marine and land mammals that swam, climbed, ran, or even flew millions of years ago. To give but one example, in a well-lighted case is the complete fossil skeleton of a 55-foot-long primitive whale. The remarkable series of skeletons exhibited in this hall were painstakingly collected by Smithsonian scientists in the field over many years and were then skillfully prepared for display in the museum laboratory of the Institution.

4. GEMS AND MINERALS

The Smithsonian Institution has one of the world's great collections of minerals. Competent observers declare that the Smithsonian's new Hall of Minerals is the best single exhibition of its kind in the world. The immediately adjacent Gem Room is also spoken of as the best exhibition of gems on public display in the United States. Thousands of specimens, many of them of great rarity and beauty, are featured in cases at an ideal height and so lighted as to show colors properly. The galleries are arranged so that the student of mineralogy can learn about both the crystalline structures of minerals and the chemical composition of the specimens displayed. But the hall is also significant from an esthetic and natural-history point of view for persons interested in minerals and gems as beautiful objects rather than as basic specimens for the science of mineralogy. One dramatic case shows selected minerals under ultraviolet light, which causes them to fluoresce with glows of many different colors.

Here too, by the use of a rotating disk, the radioactivity of a natural uranium ore is demonstrated.

This hall displays only 3 percent of the total Smithsonian's mineral collection, which has been gradually assembled by transfer to the Institution of minerals collected by other Government agencies, by purchases made possible by the expenditure of funds given to the Smithsonian exclusively for this purpose, and by gifts of minerals and gems by many citizens, not only of America but also of countries throughout the world. In the Gem Room in a specially constructed safe is the Hope Diamond, the largest deep blue diamond in the world. Because of its rarity and aura of romantic mystery it is of intense interest to visitors.

5. THE JADE ROOM

Immediately adjoining the Gem Hall is a room devoted to a collection of carved jade given to the Smithsonian in 1958 by the executors of the estate of the late Mrs. Maud Monel Vetlesen. This collection shows many large and beautifully carved jade objects from the 17th and 18th centuries. Many objects displayed here, such as the jade and gold scepters of old imperial China, are world famous.

Adjacent to the Jade Room is a new but still temporary display of outstanding examples of meteorites from the Institution's large collection of these natural objects that so unpredictably come to the earth from outer space.

6. LATIN AMERICAN ARCHEOLOGY

The Hall of Latin American Archeology brings together a unified range of important objects selected from the Smithsonian's extensive study collections of articles made by inhabitants of Central and South America before the coming of Columbus. The exhibits portray the wide range of early cultures in Latin America from those of simple hunting and fishing people to the high civilizations of the Incas, Mayas, and Aztecs.

The emphasis of this hall is given to cultural development and the interchange of material objects by Indians before the advent of Europeans. The great accomplishments of pre-Columbian Indians in developing a number system, a calendar, and the cultivation of plants are shown. Some of the stone sculpture is remarkably modern in its feeling and execution. Here, as in all other new Smithsonian halls, the visitor is not presented with ponderous cases of the almost endlessly repeated ceramic, stone, gold, silver, and other objects that are in the possession of the Institution. This old, so-called "visual storage," method of exhibition has for good reasons been abandoned. The objects on public display today are carefully chosen to give a coherent picture of each topic under consideration. Such general

instruction cannot be conveyed to the nonexpert visitor by case after case of almost identical artifacts.

It should be added parenthetically that from the standpoint of scientific American archeology and ethnology the study collections of the Smithsonian are perhaps even more important than the collections on public display. Each year these study collections are becoming organized in a more accessible way, so that they may be used effectively by qualified research scientists.

7. NORTH AMERICAN ARCHEOLOGY

The Hall of North American Archeology displays selected objects from the collections of the Smithsonian dealing with prehistoric cultures of the Eskimo and the American Indians of the far North, the North Pacific coast, California, and the Southwest. The visitor gains a synoptic view of different styles of life of human beings in these areas of the continent in the centuries before the coming of the white man. Outstanding exhibits deal with primitive methods of quarrying, mining, making artifacts of stone, cultivating crops, and developing ornaments, household utensils, and many varieties of carved and sculptured pipes used in smoking tobacco. The objects displayed in this one new hall were selected from cataloged collections which number over 600,000 items. A second North American Indian Hall, which will show the prehistoric cultures of other North American Indians, is now being prepared for public display.

8. NATIVE PEOPLES OF THE AMERICAS

This anthropological hall shows typical examples of the life characteristic of the native peoples in both North America and South America. Large glass-sided rooms have been installed depicting outstanding patterns of behavior of particular Indian tribes from California, the Southwest, and south to the Fuegians at the lowest tip of South America. Here full-scale figures prepared under the direction of expert physical anthropologists and modeled by skillful sculptors illustrate ways of life considered by anthropologists to be of special significance in relation to each group represented. Some of these world-famous models have been shown in older exhibits at the Smithsonian for many years, but before the development of the present modern, well-lighted, well-organized presentations many of them were not exhibited to best advantage. The present-day Smithsonian staff owes a debt of gratitude to their skillful and devoted predecessors who as much as 60 years ago created these scientifically correct figures that can now for the first time be displayed adequately. In this hall, also, by means of small dioramas, other typical phases of general life of the Indians of the Caribbean, of California, and of other regions of the continent are portrayed.

9. INDIAN AND ESKIMO ARTS AND CUSTOMS

The American Indian Hall dealing with the Eskimo and with the Indians of the Eastern woodlands, the Great Plains, and the North Pacific coast differs markedly from the one just described. In this hall or series of halls are displayed notable items from the Smithsonian's vast study collections which preserve for scientists hundreds of thousands of objects or artifacts of the tribes here considered. Many of the objects shown here in the beautifully lighted and carefully labeled cases are unduplicated elsewhere in the world. Today in the art world much is said of the importance of primitive sculpture and painting, but the work of the American Indians has not always been emphasized. In this hall one sees masks and figures that well illustrate the deep artistic feelings of their creators. The Smithsonian, as the central museum of the United States, has long been the repository for collections of Indian objects belonging to the Government and dating back even into the colonial period. The Institution also preserves hundreds of thousands of objects collected by the great Western explorers of our young country. Army officers on isolated posts in the old West also were valued collectors for the Smithsonian. Objects from these and other sources have through the years been carefully cataloged, protected, and preserved at the Smithsonian. In this Hall of Indian and Eskimo Arts and Customs many of these priceless treasures are on public display for the first time. In one case are originals by George Catlin selected from the 450 paintings of this master in the collection of the Smithsonian. One of these paintings, for example, shows, almost as a modern color photograph would, Indians quarrying red pipestone to use in making ceremonial tobacco pipes. Thus in the same case the visitor can see examples of completed pipes as well as Catlin's on-the-spot painting showing exactly how Indians, who were then hardly influenced at all by Europeans, carried on this skillful work. It is interesting to note that the soapstone quarried here is scientifically called "catlinite" in honor of the artist who painted the very pictures here on display. In this hall is shown an unusual example of a Great Plains tepee. This large, portable living establishment of skins, like many other specimens at the Smithsonian, was first displayed at the Centennial Exhibition in Philadelphia in 1876, at the close of which 66 freight car loads of important specimens were brought to the Smithsonian for permanent preservation. When this hall was being set up this tepee was still wrapped in old Philadelphia newspapers of the 1870's. This fact dramatically illustrates how important the present renovation of Smithsonian exhibits is for the American people and for visitors to our shores. As a result of these new displays, many of the great treasures of the Nation for the first time can be studied and under-

stood by the millions of Americans of the present generation who come in ever-increasing numbers to the museum.

10. THE WORLD OF MAMMALS

Scientifically, the Smithsonian has sometimes been called the Nation's biological bureau of standards. It has been given this name because in the Smithsonian's collections zoological and botanical specimens are used every day by hundreds of scientists for comparison and identification of new or unknown specimens. In connection with this work, for example, the Institution has developed one of the great collections of the furs of mammals of the world. Many of these pelts are kept in special storage rooms at low temperature for scientific study. In the new World of Mammals Hall, however, the visitor has an opportunity to see and study, in many instances in habitat placements, some of the most interesting and important mammals of the globe. These specimens are not presented monotonously as one "stuffed" animal after another in case after case. Rather, they are displayed so as to teach the basic principles of biology that are related to nutrition, locomotion, evolution, ecology, and survival. Here the student of zoology can see the many different ways in which the mammals of the world have adapted themselves to tropic heat and arctic snows. The ecological approach of many of these displays gives new significance to the exhibits that they present. Some of the groups of animals are dramatically arranged. Changing lights, for example, make it possible for the visitor to see first how lions view their prey, and then how the would-be prey, in this case zebras, view their would-be predators. Many of the great African mammals displayed were collected by President Theodore Roosevelt during his history-making African Expedition of 1909–10, sponsored by the Smithsonian Institution.

11. NORTH AMERICAN MAMMALS

In the hall just described, emphasis is given to mammals of the world exclusive of the great North American mammals. In this specifically North American Mammal Hall is a series of 12 large habitat groups showing the great and now often very rare wild animals of the Northern Hemisphere of America. Each of these large exhibits not only shows numbers of specimens of such animals as bison, elk, moose, and bear but also presents each group, often showing both adult and young animals, against a skillfully painted background of the terrain typical of the habitat of the animal. The mounted specimens in the foreground are shown in settings of carefully reproduced trees, rocks, and other natural items. The rapid restriction of the range of some of these great animals, and even their

virtual extinction, make it important to show here each of these groups. Species such as bighorn sheep and wolves, for example, now occupy in the wild state only a fraction of the area that was once theirs when the continent was first known to European settlers. This presentation is important in zoological training. It gives a record of animals that played a large part in providing through their furs much of the wealth of colonial America as well as food and clothing for the pioneers of the new land.

12. BIRDS OF THE WORLD

Ornithology is one of man's oldest scientific interests. This is attested by the frequent reference to birds in the Bible and in the writings of ancient classical authors. The Smithsonian possesses one of the world's great collections of birds. The new Bird Hall of the Institution has been organized to show the principal birds of the world in natural, effective, and pleasing settings. But the hall goes far beyond a mere presentation of specimens. It depicts the biology of bird life in relation to feeding habits, aerial locomotion, nest building, and the rearing of young. On the ceiling are lifelike paintings of birds in flight so skillfully done that they seem to be seen in full round of three-dimensional form as if arrested in flight. A unique case called "Birds and Man" portrays the role of birds in mythology and art. In addition to the displays in this hall, the Smithsonian has, of course, in its study collections, bird specimens from almost every geographical region of the globe.

13. LIFE IN EARLY AMERICA

The Hall of Life in Early America is an easy transition from the characteristics of the Indian population of the country and the mammals and birds of America to the life of early European settlers before the mechanization of the industrial revolution changed the American way of life. It shows the early life of the European settlers in America by demonstrating the tools and furniture that they used. For many years generous donors have brought together at the Smithsonian large collections of objects used by Americans in what may be called the era of the handcrafts. In the present hall are displayed selected items from these collections, including implements and furniture that the colonists brought with them from England, Ireland, Germany, Spain, Scandinavia, and many other countries. Next is shown the adaptation that was made on these shores of these imported objects as a new and truly American culture gradually emerged. One may see an entire house built in New England about 1690. In this building, which was taken down board by board and brick by brick and transported to Washington and reassembled, are objects that were actually used during the early period when the house was

inhabited by the artisans who built it. Many of them were collected and given to the Smithsonian by the donor of the house, Mrs. Arthur M. Greenwood. In this hall are shown other rooms depicting styles of life in different colonies—for example, a small but elegant paneled room of a Virginia gentleman. The visitor may see also a notable mahogany Philadelphia highboy and a number of cases of fine silver made in the South, Pennsylvania, New York, and New England. American forged iron, glass, pottery, pewter, and textiles are all displayed. Another feature is an entire schoolroom of an early period showing the simple desks and equipment of elementary education in the formative days of our country. This hall has been visited by millions each year since its opening. Not only are its displays significant for Americans, who can learn from them how their predecessors of European stock lived in pre-industrial revolution days, but also the hall is especially interesting and important for foreign visitors, who may absorb something of the evolution of the present style of life of the United States during the early difficult and formative years of the country.

14. GOWNS OF THE FIRST LADIES

The First Ladies Hall in a sense carries forward in one special area the same philosophy shown in the large American cultural history hall just described. Here, in a series of special rooms, reproduced from various periods at the White House, are dresses actually worn by the wife or the official hostess of each President of the United States. In developing this series an effort was made to put in place furniture and other objects actually used in the Executive Mansion in Philadelphia before the White House was built and in the White House itself in different periods. This series is especially appropriate in this truly national museum setting of the Smithsonian. For example, the room in which the dresses of Martha Washington, Dolley Madison, and Abigail Adams are exhibited contains objects that were owned and used by President and Mrs. Washington. The visitor views this full series of simulated White House rooms from a setting treated in a dignified manner to suggest the White House itself. A large and beautiful early Victorian chandelier hanging in the middle of the visitors' space does much to enhance this atmosphere. In small wall cases are other objects related to the presidential families of America, including fine examples of White House china of various periods, jewelry, and decorations used by the Presidents and their wives throughout the history of the country.

15. TEXTILE MACHINERY AND FIBERS

The Textile Machinery and Fiber Hall shows the evolution of man's efforts to make materials of plant and animal fibers from prehistoric times to the present. It supplements well the First Ladies Hall

because it demonstrates how dress fabrics themselves and many other textiles are created. It also demonstrates how the techniques of textile production have changed through the years. The visitor begins by looking at spindles recovered by archeologists from the sites of early human habitations. He then sees the development of more and more effective machinery for the manufacture of textiles. Some notable "firsts" are shown, for example, the actual model made by Whitney himself of the cotton gin and the first American spinning frame constructed by Slater in Rhode Island in the 18th century. Visitors may see a most rare and beautiful dress made years ago entirely of silk from silkworms grown in America—the silk fibers processed in America and then hand sewn in America. Modern synthetic metallic and glass fibers and a wide variety of the textiles and textile machines that have made possible the modern multiplicity of industrial and decorative fabrics are included in the displays. One of the notable exhibits of this hall is a Jacquard loom more than a century and a half old which has been put in perfect working order by Mr. Arthur Wullschleger, who gave it to the Institution. This wonderful punch-card device weaves tapestries and patterned brocades without requiring a laborious setting by human hands. The student of the history of ideas looks at this machine with surprise as he wonders why such a device which uses punch cards that are very similar in size and shape to modern punch cards, was not applied to other industrial programing tasks until many years after the Jacquard loom had proved so well its practical usefulness. In this textile hall are many typical forms of textiles arranged so that each visitor may touch and feel them. In museums visitors expect to see signs reading "Please Do Not Touch." Here the Smithsonian has reversed the injunction to "Please Touch." Experts in textiles know that only by feeling fabrics can the visitor actually gain a satisfactory knowledge of different types of materials.

16. TEXTILE PROCESSING

Immediately above the textile hall just described is another new hall devoted to the display of textiles used in human clothing, household decoration, and many industrial functions. This hall shows the history of sewing machines and other devices used in processing the textiles of civilization. Here one may also see illustrated the different types of dyeing and printing that have been used through the years for the embellishment of textiles and collections of great textile types such as lace and embroidery. No one who thinks of our modern world can fail to realize the role that the sewing machines of factory and home have played in the emancipation of women from monotonous toil. The collection of these interesting and effective machines at the

Smithsonian is one of the best in the world. The thoughtful visitor who studies them learns not only a mechanical but also a sociological lesson of importance.

17. POWER MACHINERY

In the Hall of Power Machinery the visitor sees how human beings have progressed from the use of their own puny muscles to the great power devices of our industrial age. Here original machines and patent models illustrate the contribution of engineers and inventors such as Stevens, Corliss, Otto, and Diesel. By diagrams and pictures, waterwheels and windmills are shown. Included is a working model of a classical heat engine that was used to open and close temple doors in ancient Greece. Major displays demonstrate the invention and the development of the steam engine portrayed by a series of working models of great early steam engines which may be activated by each visitor at the push of a button. Also on display are the beginnings and indeed the full development of the internal combustion engine and some of the early devices of Edison and others that show the rise of the use of electricity as a power source. A permanent display of the role of atomic energy in peacetime activity and defense is not yet open to the public, but a number of temporary exhibits on this subject have been presented from time to time by the Smithsonian.

18. FARM MACHINERY

In the Hall of Farm Machinery are shown a selection of the implements and devices which man has contrived to further his basic work of securing food from the soil. The emphasis is upon the history of American agricultural implements. Here, for example, the visitor may trace the evolution of the plow as used by North American settlers from Europe from the earliest days to the present. One interesting phase of this development shows how President Thomas Jefferson used his mathematical and scientific knowledge to make one of the first real improvements in the plow in several thousand years. Also shown are some of the "historic firsts" of the more complex agriculture machinery which has made America famous throughout the world. These exhibits show how the development and use of labor-saving machinery for planting, cultivating, and harvesting crops helped solve the problems of feeding America's rapidly growing urban population after the Civil War.

19. PRINTING ARTS

Another specialized group of industrial devices is shown in the new Printing Arts Hall. The gradual development of pictorial and text printing is illustrated in these displays. The famous printing press used by Benjamin Franklin in London in 1726 is here. The emphasis

is upon the various processes by means of which printing blocks and later movable type have been used down through the centuries, together with the techniques and tools involved. Here is also demonstrated how black-and-white and color pictorial prints have been made, especially in recent years. Examples are shown of the work of some of the great printmakers of the world, including such outstanding artists as Rembrandt and Dürer. In the study collections of this division are examples of the work of many of the great printmakers of the last six centuries.

20. MILITARY HISTORY

The Military History Hall is divided into two large sections, one devoted to the United States Navy and Marine Corps, the other to the United States Army. Elaborate exhibits of the development of aviation, both civil and military, are shown in the National Air Museum to which reference is made below. The Naval-Marine Corps Hall shows the evolution, by the use of models and contemporary prints and charts, of the Navy from the first commissioned vessel of 1775 to the atomic submarine. Many portraits and memorabilia of the great Naval and Marine leaders of our Nation are exhibited. One who studies the exhibits of this hall can clearly see how the rise of the modern Navy is related to the evolution of sources of power for naval vessels as illustrated in the nearby Power Hall. Here also can be seen the vessels and equipment that led to the emergence of the sea strength of the United States from the small sailing craft of the colonies to the present Navy of this country as a preeminent world power. The change from wooden to steel warships and the development of modern naval armaments are portrayed. Also shown are a few selected examples of objects recovered from the ocean floor by the use of the new techniques of marine archeology.

The hall showing the rise of the American Army begins with examples of uniforms and equipment of colonial troops. At the entrance is placed the actual field uniform worn by General Washington when he was conducting his great campaigns of the War of Independence. The visitor can also follow the evolution of American arms and equipment down through the years. Attention is given to present-day uniforms and the arms used in each of the great wars of the Nation. Outstanding objects here include a beautiful bronze cannon brought to the colonies by General Lafayette, uniforms of both Union and Confederate officers of the Civil War, General Sheridan's horse on which he made his famous ride, a complete display of modern military missiles, including those with atomic warheads, and a very complete display of American military heraldry including the battle ribbons of all the Nation's great Army regiments.

21. NUMISMATICS

The Numismatic Hall, or Hall of Monetary History and Medallic Art, can best be described as an amazingly complete world museum of the history of money. Here are shown real examples of the first coins ever minted in ancient Greece. Following the case that shows these very early coins are others in which a visitor can see illustrated the spread of coinage throughout the ancient Mediterranean world. Also shown are means of exchange other than coins and samples of the gold and other monetary forms of non-European nations. The special feature is the great collection of colonial American and United States coins and paper money for which the Smithsonian has long been famous. The newly opened presentation of coins has a completely novel objective, for it is organized to teach the history and geography of the world in relation to money. Many of the outstanding gold pieces from the Institution's great Straub collection are on display, as are also coins of the recently presented Du Pont collection of Russian money. Many examples in the well-lighted cases are from the United States mint collection, which is now part of the over-all Smithsonian collection. Examples of almost every coin ever struck in America are thus on view or in the study collections of the Institution. The visitor to this hall who comes to it with intellectual curiosity will learn not only the fascinating story of coinage, sculpture, design, and medallic art through the centuries, but also much else that is important in the history of economics and even of civilization itself.

22. HALL OF HEALTH

Years ago, national representatives of American medical organizations urged the Smithsonian to establish a hall of health. For many years the original hall was open, but gradually it became shabby and outmoded. The modern Health Hall at the Smithsonian, on the contrary, presents the basic anatomical and physiological processes of human beings as they are known to modern science. The hall shows something of the mechanisms by means of which electronics and other technologies assist the physician in measuring and recording the human heart beat, blood pressure, respiration, visual and auditory acuity, and the like. Here the visitor can watch his own heart beat on a cathode-ray tube by holding a receiver on his chest. In this hall is located a fascinating transparent human figure which by a series of lights and a concomitant electronically reproduced lecture shows in a vivid and accurate way the principal organ systems of the human frame and how they work.

23. HISTORY OF MEDICINE, DENTISTRY, AND PHARMACY

Immediately adjacent to the Hall of Health is the Hall of Medicine, Dentistry, and Pharmacy, where the evolution of many of the devices used by physicians, surgeons, dentists, and pharmacists down through the years is shown. The development of such now common aids to the physician's practice as the stethoscope and blood-pressure instrument is traced. Some of the more elaborate devices of modern medicine and surgery such as the artificial heart and the X-ray apparatus are also exhibited. Here too is displayed a complete medieval pharmacy with an almost unique and very beautiful collection of early pharmaceutical ceramics and glassware.

THE NATIONAL AIR MUSEUM

Of all the notable renovations of exhibit presentations at the Smithsonian, none has been more outstanding than the recent transformation of the small temporary Air and Space Building. The National Air Museum, a special unit of the Institution, has in its custody probably the world's greatest collection of aircraft and instruments and objects related to aviation. Nearly all the great treasures of this museum are in storage. Some of its outstanding possessions, such as the first Wright plane and the Lindbergh plane, are on display in the Arts and Industries Building. The main museum displays of aviation, however, are now shown in a building built as a temporary test center for Liberty Motors during the First World War. This galvanized-iron building on Independence Avenue behind the original Smithsonian Building has been renovated in such a way that the new exhibits installed in it can be moved without loss to a new and permanent building when such a building is constructed. Even the present "temporary" structure in its renovated form gives a vivid demonstration of the public's interest in aviation. This small, far from commodious structure has now become one of the great attractions of Washington. During the first 12 months after this renovated building was opened, more than a million visitors sought it out and studied its exhibits portraying man's conquest of air and space. Here are shown a few examples from the Smithsonian's possibly unrivaled collection of kites. The basic principles of the aerial navigation of birds as studied by the first aviation scientists are displayed. In the center of the building are a few of the actual early aircraft of peculiar significance in the history of aviation. Models of hundreds of types of balloons and heavier-than-air craft are shown. Here also are presented many early and important types of aircraft engines. One of the notable exhibits is a collection of the great early liquid-fuel rockets made by America's, and indeed the world's, pioneer scientific student of devices for the exploration of space, the late

Dr. Robert H. Goddard. The unique specimens of Goddard's work were given to the Smithsonian by Mrs. Goddard in tribute to the early support that the Smithsonian gave to Dr. Goddard's scientific work. Other more modern space-flight specimens on display are the first recovered American Space Flight nose cone, the Able-Baker space flight apparatus, the first recovered orbiting satellite (Discoverer XIII), and many other "firsts" of modern air-space science.

Immediately outside this temporary building are displayed not models, but actual examples, of present-day rockets, including a United States Army Jupiter C, a United States Navy Vanguard, a Navy Polaris, and an Air Force Atlas.

In the paragraphs above reference has been made to the present progress of the renovation of exhibits at the Smithsonian. Mention could also be made to improvements and better lighting used in the display of the outstanding collections of oriental objects and paintings at the Smithsonian's Freer Gallery of Art. The National Collection of Fine Arts of the Smithsonian has also improved some of its temporary galleries. Notable new installations, including rooms for the decorative arts, have been opened at the National Gallery of Art, which is a bureau of the Smithsonian Institution.

The summaries that have been presented in the immediately preceding pages have been given to bring the reader of this report up to date in regard to one aspect of the work of the Smithsonian. This is a report of progress. It suggests something of the accomplishments of the past 8 years in transforming the formerly old and then sadly outmoded museum presentations at the Smithsonian Institution into modern effective and educational exhibits. During 1953, the year in which this work began, 3,429,429 visitors came to the Smithsonian buildings on the Mall. In the year covered by the present report, as noted elsewhere, 7,103,474 came to these same buildings. There can be no doubt that the renovations summarized here have met warm public acceptance.

This whole great program of renovation has been possible only because of the enthusiastic support that has been given to it by the Board of Regents of the Institution, by the Congress, and by the labors of the Smithsonian's devoted and skillful staff of curators and exhibit workers. Because of this work it is now beginning to be possible for many millions of American citizens and for foreign visitors also to see the great national treasures of the Smithsonian in an orderly and also in an educationally significant way.

Other new halls are in the process of development and will be open to the public as soon as the complex work of constructing them can be completed by the small staff of the Institution. These other new halls include a Hall of Dinosaurs, a Hall of Pleistocene Mammals, a

Comparative Anatomy Hall, a large Hall of Botany and Wood, a Hall of Ocean Life, a Hall of Reptiles and Fishes, a Hall of Man emphasizing the methods and accomplishments of physical anthropology, and a Classical Archeology Hall, a Peoples of Asia and Africa Hall, a Peoples of the Pacific Hall, a second North American Archeology Hall, a second Geology Hall, and a Hall of Insects of the World. Work on still other major displays of collections already in storage at the Smithsonian is underway so that they may be presented in the new Museum of History and Technology Building when this structure is completed.

In introducing the present report, reference was made to the emphasis given by James Smithson and Joseph Henry to the twin ideas of the diffusion and the increase of knowledge among men. Although the museum displays described in the foregoing pages constitute an important means of diffusing scientific and technological knowledge, the Institution employs many other means to promote this diffusion. One of these has traditionally been publications, and during the year represented by this report the publication program was advanced by 97 titles issued under Smithsonian imprint; and nearly 775,000 copies of Smithsonian publications were distributed, an increase of about 18 percent over the previous year. Details of these publications are given on later pages of the report. It may be pointed out that the publications of the Smithsonian are known worldwide, and the "exchange publications" that come without charge to Washington in response to Smithsonian publications from scientific research organizations all over the world play an important role in maintaining in America a complete library of scientific research. Such a collection is basic in modern American life, not only in national defense but also in the development of the cultural and industrial life of the country.

It is difficult in brief compass to describe the research activities of the Institution. The reader of this report, however, is especially urged to note the pages that present the results of research studies conducted during the current year by the Institution. The Astrophysical Observatory of the Smithsonian, for example, is concerned in the development of the science that is basic to a modern understanding of astronomy and space. Only a few years ago research in astrophysics seemed interesting but highly theoretical. Today the significance of investigations in this area for our national defense and welfare is recognized everywhere. Research investigations are also conducted in almost all the other specialized divisions of the Institution as reported on later pages of this report. Special emphasis should be given to the fact that it is the research activities of the members of the Institution's scientific staff that have established its worldwide reputation and won for it academic distinction.

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 membership of the Board of Regents remained unchanged except for the new Vice President of the United States, the Honorable Lyndon B. Johnson, who became an ex-officio member to succeed the Honorable Richard M. Nixon on January 20, 1961. 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, Overton Brooks, Clarence Cannon; citizen members: John Nicholas Brown, Arthur H. Compton, Robert V. Fleming, Crawford H. Greenewalt, Caryl P. Haskins, and Jerome C. Hunsaker.

The usual informal dinner meeting, preceding the annual meeting, was held on January 12, 1961, in the main hall of the Smithsonian Building amid exhibits showing the most recent developments in the work of the Smithsonian bureaus. Col. Howard I. Chapelle spoke on "Description of the American Watercraft Collection"; Dr. Charles O. Handley, Jr., on "Mammal Survey of Panama"; Dr. T. Dale Stewart on "Reconstructing Heads of Ancient Man"; Dr. Harold P. Stern on "Hokusai in the Freer Gallery of Art"; and Dr. Fred L. Whipple on "Dust in Space."

The annual meeting was held on January 13, 1961. 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, 1960.

The Regents participated in the ceremonies for the laying of the cornerstone of the Museum of History and Technology on the afternoon of May 19, 1961, and met at 5 o'clock that day in the Regents Room for the spring meeting of the 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 221. Funds appropriated to the Institution for its regular operations for the fiscal year ended June 30, 1961, totaled $8,114,000. 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, $1,304,000; from the National Park Service, Department of the Interior, for the River Basin Surveys, $123,895.

VISITORS

Visitors to the Smithsonian group of buildings on the Mall reached a total of 7,103,474, an all-time high and 608,844 more than the previous year. April 1961 was the month of largest attendance, with 1,082,827; August 1960 second, with 1,051,733; May 1961 third, with 990,230. Table 1 gives a summary of the attendance records for the five buildings; table 2, groups of school children. These figures, when added to the 1,032,340 recorded at the National Gallery of Art bring the year's total number of visitors at the Institution buildings on the Mall to 8,135,814.

TABLE 1.—*Visitors to certain Smithsonian buildings during the year ended June 30, 1961*

(1) Year and month	(2) Smithsonian Building	(3) Arts and Industries Building	(4) Natural History Building	(5) Air and Space Building	(6) Freer Building	(7) Total
1960						
July	151, 286	385, 718	269, 451	135, 672	16, 021	958, 148
August	178, 859	365, 810	316, 074	171, 414	19, 576	1, 051, 733
September	55, 579	153, 369	103, 240	58, 073	12, 011	382, 272
October	50, 835	130, 833	112, 431	47, 384	8, 079	349, 562
November	50, 864	110, 213	117, 335	49, 581	8, 088	336, 081
December	22, 786	58, 899	53, 439	23, 703	4, 608	163, 435
1961						
January	34, 523	67, 348	73, 588	25, 023	5, 419	205, 901
February	24, 812	70, 596	59, 541	29, 469	4, 428	188, 846
March	57, 184	157, 668	135, 663	54, 715	8, 645	413, 875
April	154, 793	483, 752	283, 071	144, 790	16, 421	1, 082, 827
May	116, 978	457, 832	286, 067	115, 758	13, 595	990, 230
June	126, 027	470, 333	238, 073	132, 276	13, 855	980, 564
Total	1, 024, 526	2, 912, 371	2, 047, 973	987, 858	130, 746	7, 103, 474

TABLE 2.—*Groups of school children visiting the Smithsonian Institution during the year ended June 30, 1961*

Year and month	Number of children	Number of groups	Year and month	Number of children	Number of groups
1960			*1961*		
July	6, 233	199	January	7, 804	223
August	3, 896	157	February	12, 510	365
September	2, 048	82	March	41, 558	1, 004
October	13, 061	362	April	85, 084	1, 817
November	21, 995	579	May	115, 996	2, 623
December	8, 238	254	June	44, 650	1, 042
			Total	363, 073	8, 707

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, 1961:

COLLECTIONS

During the year 971,150 specimens were added to the national collections and distributed among the eight departments as follows: Anthropology, 19,764; zoology, 369,701; botany, 103,160; geology, 229,676; science and technology, 4,231; arts and manufactures, 5,521; civil history, 237,323; and armed forces history, 1,774. The total number is less than half as many as recorded last year, when an extraordinary number of postage stamps, approaching a million and a half, was accessioned. 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 54,963,805.

Anthropology.—Through an arrangement with Dr. Ralph S. Solecki, of Columbia University, whereby the Smithsonian Institution sponsored his 1957 expedition to Iraq, the division of archeology received 8,770 artifacts from Shanidar cave and neighboring sites. In addition to a few specimens from the historic and protohistoric cultural periods, the representation is mainly from the proto-Neolithic and the Mousterian, the whole indicating a time span of around 65,000 years. The division also received, by transfer from the River Basin Surveys, 5,153 artifacts collected at numerous prehistoric sites in South Dakota and Wyoming. Mrs. Virginia M. Pollak added to her earlier generous donations a wooden ibis from the Ptolemaic-Roman period of Egypt.

Of special interest among the new accessions in the division of ethnology are two rare Chinese scrolls written in the Chinese and Manchurian languages and representing awards in the years 1753 and 1868 for loyal services to the Chinese Government, donated by Dr. David C. Graham, honorary research associate in biology. A late 19th-century Chinese four-panel lacquer screen was received from the estate of John T. Owens. The decoration thereon, showing four

birds in a natural setting, has been executed by inlaying mother-of-pearl, rose quartz, white and stained ivory, and semiprecious stones. A group of 54 ethnological specimens of Eskimo manufacture, collected in Alaska in 1908, was presented by Dr. F. F. Fellows, West Linn, Oreg. A representative collection of 104 smoking pipes, mainly from the Near East, India, China, and Japan, was given by Dr. Leo Stoor, of Cleveland. A good collection of 84 Micronesian objects was obtained in exchange from John H. Brandt, of New York City. Among the rare specimens in this group is a type of necklace from Yap no longer obtainable from the natives.

The division of physical anthropology added to its collection of American Negro skeletal remains 14 skulls and a few miscellaneous bones recovered by the District of Columbia coroner, Dr. A. Magruder MacDonald, when an abandoned cemetery near the Calvert Street bridge in Washington was exposed in the course of building operations. The Zoller Laboratory of Dental Anthropology of the University of Chicago presented the division with 11 standard models for classifying crown characters of human deciduous teeth. The models, accompanied by an explanatory manual, were prepared by Dr. Kazuro Hanihara, of Sapporo Medical College, Japan, and are based on a series of 600 subjects representing various racial groups.

Zoology.—The division of mammals acquired a total of 4,076 specimens, comprising 42 accessions. Dr. Robert E. Kuntz forwarded nearly 1,000 specimens from Formosa and 400 from North Borneo, collected by field parties of U.S. Naval Medical Research Unit No. 2. Bernard R. Feinstein, of the Museum staff, working in cooperation with the Army Medical Research and Development Command and the Bernice P. Bishop Museum, sent 600 mammals from South Vietnam. Dr. Robert Traub forwarded 121 additional specimens collected by the U.S. Army Medical Research Unit. Capt. Vernon J. Tipton sent 273 mammals collected in Panama by the Army Preventive Medicine Division. E. V. Komarek presented 83 mammals, mostly carnivores, from the southeastern States, as well as an additional lot of 53 small mammals from the Southwest; Russell E. Mumford and Ralph D. Kirkpatrick each sent additional mammals from Indiana; and the Virginia State Department of Health, through J. T. Banks and T. M. Mullman, presented 44 mammals collected in the course of epidemiological surveys.

The same sources that were responsible for several of the mammal collections referred to above contributed some important accessions for the division of birds. From the lowlands of North Borneo, a series of 512 bird skins was received from the U.S. Naval Medical Research Unit No. 2. A total of 565 bird skins, 6 alcoholic specimens, and 20 skeletons from South Vietnam resulted from the activities sponsored by the Bernice P. Bishop Museum and the Army Medical

Research and Development Command. Received by transfer from the U.S. Fish and Wildlife Service were 1,411 bird skins and 6 alcoholic specimens from Formosa.

Noteworthy collections received in the division of reptiles and amphibians include 19 salamanders from Alabama, donated by Leslie Hubricht. A fine series of Virginia amphibians, collected by the late Walter B. Newman, was received as a gift from his mother, Mrs. Helen B. Newman. By transfer from the U.S. Army Medical Research Unit, through Lt. Col. H. J. Baker, came 29 snakes, mostly from Selangor, an area from which the Museum has had few specimens. A series of 28 Venezuelan reptiles and amphibians collected for the Museum by Dr. C. O. Handley, Jr., and D. L. Rhymer contains some frogs that are valuable for comparison with Colombian material now being studied. Another valuable addition to the amphibian group from Thailand are 39 specimens collected in South Vietnam by Bernard R. Feinstein.

The division of fishes accessioned a large collection consisting of 2,702 specimens from the Fourth Smithsonian-Bredin Caribbean Expedition. The U.S. Fish and Wildlife Service, through Harvey R. Bullis, Jr., and Daniel M. Cohen, contributed another large important collection, totaling 1,114 fishes. Dr. Eugenie Clark, of the Cape Haze Marine Laboratory of Florida, and Dr. H. Steinitz, of the Hebrew University of Jerusalem, donated 778 marine fishes collected in the Red Sea by Dr. Clark; these specimens are very valuable because the Red Sea area is the type locality of numerous kinds of fishes, some of which are endemic. Dr. Hurst Shoemaker, of the American University of Beirut, donated 361 fishes from Lebanon. Among the valuable collections received for identification were 453 Formosan fishes through Dr. Robert E. Kuntz, U.S. Naval Medical Research Unit No. 2, and 728 specimens from Africa and South America from Dr. Herbert R. Axelrod, of Tropical Fish Hobbyist Publications, Jersey City.

A very valuable accession acquired by the division of insects is the John C. Lutz collection of Hemiptera, consisting of 87,371 specimens. Particularly rich in Neotropical species, this assemblage contains 668 types of various kinds, including holotypes of 15 species. Another very important accession is the N. Baranov collection of Palaearctic tachnid flies, consisting of 4,611 specimens representing 305 genera, 68 of which are new to the collections, and 812 species, of which 499 were not previously available for study in the Museum. Other notable contributions include: 3,306 miscellaneous specimens from North and South America, donated by Dr. Charles P. Alexander; 2,915 Hawaiian insects presented by A. J. Ford, of Honolulu; 2,938 miscellaneous specimens from Pakistan, contributed by Dr. J. Maldonado Capriles; 2,127 Lepidoptera from Wisconsin given by William E.

Sieker; 7,848 miscellaneous insects from various parts of the world given by N. L. H. Krauss; and 1,128 specimens of Hymenoptera donated by Dr. Karl V. Krombein.

Contributing materially to another record-breaking year for accessions in the division of marine invertebrates were 54,480 amphipod crustaceans, including 15 type specimens, received from the Scripps Institution of Oceanography, University of California. From the Universitetets Zoologiske Museum, Copenhagen, through Dr. H. Volsøe, were received 9 deep-sea invertebrates from the world-renowned Danish Deepsea Expedition of the *Galathea*, including paratypes of unusual holothurians, starfishes, polychaete worms, and sea anemones. The Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands, through Dr. L. B. Holthuis, donated 402 crustaceans, including two scyllarid lobsters and an authoritatively identified set of European isopods. A collection of 5,528 miscellaneous Antarctic invertebrates from Operation Deep Freeze IV was received from Stanford University, through Dr. Donald E. Wohlschlag. Another large series of 5,256 miscellaneous marine invertebrates was collected for the Museum in Bermuda by Mrs. LaNelle W. Peterson.

The most important accession in the division of mollusks consisted of 12,200 specimens collected at Jaluit Atoll, in the southern Marshall Islands, by Dr. Harald A. Rehder. The Fourth Smithsonian-Bredin Caribbean Expedition added 6,000 mollusks from Yucatán. Dr. Wendell P. Woodring collected 485 specimens of marine mollusks on the Atlantic coast of Panama. From the Institute of Oceanology of the Academy of Sciences of the USSR, through Dr. E. A. Filatova, came 607 specimens of fresh-water mollusks from the USSR.

Botany.—One of the most important accessions in the department was the *Cladonia* collection of the late Alexander W. Evans, comprising 39,204 specimens, received in exchange from the Osborn Botanical Laboratory of Yale University. Unusually fine specimens of *Rhododendron* and *Primula*, numbering 2,895, collected in Asia by George Forest, were received in exchange from the Royal Botanic Garden, Edinburgh, Scotland. Others, also in exchange, were: 7,786 specimens of Asia and South America, mostly significant historical collections, from the Museum National d'Histoire Naturelle, Paris; 1,287 plants of Indonesia from the Herbarium Bogoriense; and 527 photographs of plants in the Philip Miller Herbarium from the Bailey Hortorium, Ithaca, N.Y.

The American Musuem of Natural History forwarded 15,780 specimens collected by L. J. Brass on the Sixth Archbold Expedition to New Guinea. The University of California sent 497 specimens of South American plants collected by W. Eyerdam on the Sixth Botanical Garden Expedition to the Andes, in return for identifications.

609118—61——3

Dr. Mason E. Hale and Dr. Thomas R. Soderstrom collected 3,841 specimens in Mexico, consisting mostly of lichens, and Dr. John E. Ebinger collected 5,086 specimens in Panama, primarily on Barro Colorado Island. There were transferred from the U.S. Geological Survey, Department of the Interior, 2,650 Alaskan plants collected by Lloyd Spetzman.

The division of woods received in exchange from the Yale School of Forestry 474 wood samples collected by Dr. John J. Wurdack and L. S. Adderley in Venezuela; 966 slides of Malayan woods from the Forest Research Institute, Kepong, Selangor, Malaya, through P. K. Balan Menon; 314 wood samples with voucher herbarium specimens collected in Sarawak, from the University of Oxford, England, and 1,784 microscope slides of pollen from the Rancho Santa Ana Botanic Garden. Dr. William L. Stern presented 609 samples of wood he collected in Panama.

Geology.—Among the noteworthy gifts received in the division of mineralogy and petrology are a very fine cubic crystal of diamond, weighing 82.5 carats, from Sierra Leone, and a three-quarter carat diamond crystal in matrix from the Bulfontein Mine, South Africa, both presented by Dorus Van Itallie; a large group of wulfenite crystals from the Glove Mine, near Amado, Ariz., and a gem-quality twin crystal of chrysoberyl from Minas Gerais, Brazil, both donated by Bernard T. Rocca, Sr.

Important additions to the mineral collection received in exchange are becquerelite and fourmarierite from Republic of the Congo (Leopoldville); raspite, Australia; cronstedtite, Hungary; and benitoite, California. Newly described species received in exchange are schoderite and metaschoderite, Nevada; masuyite and lueskite, Republic of the Congo (Leopoldville); yavapaite, Arizona; and wolsendorfite, Germany.

The Roebling collection was increased by 1,625 specimens by purchase from the Roebling fund or by exchange. Among the most important of these are a collection of 40 specimens of wulfenite, each of exceptional quality, from Arizona; several adularia crystals from Switzerland; a well-formed cube of uraninite four inches on an edge, from Morogoro, Tanganyika; and a very fine large gadolinite crystal from southern Norway. Several specimens of outstanding quality were added to the Canfield collection by purchase. These include a 90-carat peridot crystal from Zebirget, Egypt; a very large sphene crystal from Baja California; bournonite, England; and apatite, Italy.

Gems obtained for the Isaac Lea collection by purchase from the Chamberlain fund include a pink scapolite from Burma weighing 12.33 carats; a blue topaz from Texas weighing 146.35 carats; a

peridot from Arizona weighing 22.9 carats; and a 9.53 carat yellow tourmaline from Brazil.

During the past year the meteorite collection continued its growth. Seven meteorites new to the collection were obtained: Abee, Canada; Bruderheim, Canada; Kandahar, Afghanistan; Treysa, Germany; Utzenstorf, Switzerland; Aroos, Russia; and Moab, United States.

The division of invertebrate paleontology and paleobotany acquired some important fossil collections. The famous Greene collection, comprising 110,000 specimens and consisting mostly of Devonian corals, was given by the American Museum of Natural History. A bequest was received from the estate of Mrs. Ruby F. Renfro of approximately 50,000 specimens of Pennsylvanian, Permian, and Cretaceous fossils of north-central Texas and a small collection from Europe. Other gifts include 1,000 Devonian invertebrate fossils from the upper Dundee limestone and the Silica shale, Michigan and Ohio, donated by Dr. Erle G. Kauffman, 36 fossil crabs from the Miocene of Virginia, from George Webb; and 167 smaller Foraminifera from the Mississippian of southern Indiana, Kentucky, Tennessee, and Ohio, presented by Dr. J. E. Conkin.

Fieldwork made possible from funds of the Walcott bequest yielded 600 echinoids from the Paleocene, collected in Georgia by Dr. Porter M. Kier in collaboration with Dr. Druid Wilson of the U.S. Geological Survey; 2,500 Upper Cretaceous, Paleocene, and Eocene invertebrate fossils collected in Maryland by Dr. Erle G. Kauffman, with Dr. Norman F. Sohl and Dr. Harlan R. Bergquist of the U.S. Geological Survey; and 1,000 Pennsylvanian fossils collected in Texas by Dr. G. Arthur Cooper and Dr. Richard E. Grant.

The division of vertebrate paleontology received an outstanding accession of about 202 specimens representing fish, amphibians, and reptiles from various Permian formations in Texas and Kansas. These specimens were collected by Dr. Nicholas Hotton III and John E. Gassaway, through funds provided by the Walcott bequest. Particular mention is made of a nearly complete and articulated skeleton of the small predaceous amphibian *Acroplous vorax* taken from the Permian Speiser formation of Kansas, and a large part of a skeleton of the primitive cotylosaurian reptile *Labidosaurus* sp., from the Permian Arroyo formation of Texas. The jaws, part of the skull, and several vertebrae of a very large baleen whale were collected from the Miocene Yorktown formation near Hampton, Va., by Dr. Nicholas Hotton III, Kurt F. Hauschildt, and Dr. Frank C. Whitmore, Jr. Dr. Hotton, assisted by William E. Moran, a former employee, also secured a partial skeleton, including the greater part of a skull, of a rare embolomerous amphibian from the Mauch Chunk formation of Mississippian age.

Science and technology.—Two astrolabes of unusual interest were acquired by the division of physical sciences. Through the generosity of Lessing J. Rosenwald a very fine medieval English instrument was received, having zoomorphic star pointers as a notable feature. Although undated and unsigned, it is dated by the calendar scale about 1325. A second astrolabe received this year is an Hispano-Moorish instrument by Muhammad ibn-Sahli. This specimen exhibits a mixture of Islamic, Christian, and Jewish characteristics in its decoration.

Two major refrigerating machines for exhibit in the new hall of power machinery were received this year: the first commercially successful centrifugal refrigeration compressor from Carrier Corporation, which was generously restored by the Frick Company, and a typical steam-driven reciprocating ammonia compressor from Clifton Springs Sanitarium and Clinic.

About 3,000 large original tracings, on cloth, of heavy mining machinery for the period 1875–1902 were received from Calumet and Hecla, Inc. This valuable collection representing an important part of the creative work of Erasmus D. Leavitt (1836–1916), a widely known and highly honored mechanical engineer, was located by Robert M. Vogel, associate curator. The archival collections of the division have grown, largely through the efforts of Mr. Vogel, to a major repository of source materials in the history of mechanical and civil engineering.

Among the outstanding gifts in the section of marine transportation is a model of the brigantine sloop *Ferret.* This Admiralty model is a gift of Lansdell K. Christie. The Grace Line, Inc., presented a model of the passenger liner *Santa Paula.* In the section of land transportation a colonial chaise, including funds for its restoration, was received from Stewart Huston. A collection of fire-fighting apparatus was donated by Dr. Karl B. Bretzfelder. The Baltimore & Ohio Railroad Co. gave a collection of glass plate negatives and car drawings, through L. W. Sagle.

The division of electricity has been particularly fortunate in obtaining the Palmer collection of early electrical equipment from Princeton University. The collection is an important one and provided most of the illustrations in M. Maclaren's *Rise of the Electrical Industry during the 19th Century.* It was exceptionally rich in examples of laboratory meters, telephonic apparatus, power switchgear, and incandescent lamps. Two other large groups of specimens were also acquired: one from Brown University, consisting primarily of motors and generators, together with some interesting wireless telegraph equipment, and one from the Weston Instrument Company, composed of early commercial meters.

The acquisition of a David Rittenhouse half-size tall clock, which has an astronomical type dial, enhanced the collection of timekeeping

instruments. This clock is one of Rittenhouse's earlier works, and it is probably the product of his own hands. Several other outstanding clocks were also obtained, including one by Gideon Roberts, who introduced mass-produced wooden clocks.

Among the accessions in medical sciences is a significant collection of dental instruments, received from the S. S. White Dental Manufacturing Company. The New England Hospital for Women and Children Nurses Alumnae Association donated an early uniform worn by Linda Richards and other personal memorabilia, including a Tolles microscope. Miss Richards was the first woman to receive a diploma from any American training school for nurses. A number of medals, diplomas, and other memorabilia have been received from the estate of Abraham Flexner, in accordance with his bequest.

Arts and manufactures.—A significant acquisition in the division of textiles is a collection of over 100 19th-century sewing machines presented by the Singer Manufacturing Company, through Bogart F. Thompson. Added to the fine group already accumulated, these give the Museum the world's leading historical collection of sewing machines. An outstanding collection of over 200 sewing birds, hemming clamps, and related needlework accessories was donated by Miss Mabel Whiteley. Of special interest also is the receipt of a collection of lace and embroidery from Mrs. Herbert Arthur May. The laces include examples of Chantilly, Brussels, Maltese, and Venetian needlepoint.

Several interesting items were acquired by the division of ceramics and glass. A rare Castleford urn with painted decorations was presented by Mrs. George H. Myers. Mrs. William A. Sutherland donated 28 pieces of porcelain, including an English Lowestoft teapot, a China trade porcelain fruit basket, Sevres tea set, and a Liverpool coffee pot, all of the 18th century. R. Whornton Wilson gave a unique piece of Americana, consisting of an Oriental Lowestoft cider jug and cover, with painted decorations including the inscription "Jefferson and Liberty," surmounted by an American eagle and 17 stars.

A fine group of chiaroscuro woodcuts was acquired by the division of graphic arts. The group included two examples by the important early 16th-century pioneer, Antonio da Trento, *St. Matthew* and *The Martyrdom of St. Paul and St. Peter; The Descent from the Cross*, by Ugo da Carpi, founder of the chiaroscuro process in Italy; work by the most important 17th-century practitioners include *Aeneas Carrying Anchises* by Ludolph Businck; *Death of Lucretia* by Paulus Moreelse; and *Sibyll with Books* and *Virgin with Jesus and John* by Bartolomeo Coriolano. The 18th century is represented by John Baptist Jackson's *Pieta* and the outline block for his *The Virgin in the Clouds* and *Six Saints*. A Lechrome National Photocolor One-

Shot Color Camera was presented to the section of photography by Ralph E. Wareham. This type of camera simultaneously exposes a complete set of color separation negatives which are used to produce color prints. Technicolor Corporation donated a display of motion-picture film strips explaining their Technirama process of cinematography.

The division of manufactures and heavy industries acquired several significant specimens. In the section of petroleum, Universal Oil Products Company and Esso Standard Oil Company, in association with the M. W. Kellogg Company, prepared models and flow charts illustrative of phases in the development of petroleum refining. William C. Cleveland, consultant in the section of general manufacturing, has been successful in locating more than 100 machines typical of the development of the metalworking trades. These will provide an excellent basis for a treatment of the history of fasteners of all kinds. A number of important pieces of equipment have been transferred by nuclear physics laboratories at Argonne, Chicago, and Washington, D.C.

Civil history.—President John F. Kennedy gave the Smithsonian Institution a magnificent volume, the *Atlas Nouveau*, compiled by Nicolas Sanson and published in 1692. The richly illustrated atlas, intended for the instruction of the Dauphin of France, is bound in handsome contemporary red leather and gilt binding.

Former President Dwight D. Eisenhower donated a Portuguese standing lamp in silver, a carved teakwood elephant and rider presented to him by His Majesty Bhumibol Adulyadej of Thailand, and an elaborately carved scene from the Mahabharata in ivory and sandalwood, presented to him by the President of India. Mr. Eisenhower also gave the twin microphones over which his voice was frequently carried during his 50,000-mile campaign of 1952.

Mrs. Dwight D. Eisenhower presented a pink embroidered organdy dress given her by Mrs. Carlos P. Garcia, wife of the President of the Philippines. Ralph E. Becker continued his donations of political campaign paraphernalia of the past. Significant among the gifts is a preserve crock inscribed "25,000 Majority General Jackson"—a protest against the fact that in the election of 1824 General Jackson rolled up a majority of greater than 25,000 popular votes over his nearest rival, John Quincy Adams. He lost the election, however; since no candidate had a majority of the total vote, the House of Representatives chose Mr. Adams from the three candidates having the highest number of electoral votes.

Noteworthy among accessions received in the division of philately and postal history is a specialized collection of early Peru donated by Bernard Peyton, consisting of more than 13,000 stamps and covers in 16 albums. The material portrays the postal history of Peru from

the period of Royal Spanish Service to the end of the 19th century. Essays, proofs, and color trials augment the approved stamps, and each issue is thoroughly explored by means of cancellations. One album presents the Pacific Steam Navigation Company's stamps and essays including use on covers. The provisional stamps made necessary by the occupation of Chilean forces in 1879–82 are of great historical value. George L. Lee presented a collection of Egyptian stamps from the Royal Imperforata Printings prepared for Kings Fuad and Farouk. This unusual material was sold by the present Egyptian Government in 1954. Mr. Lee also gave a used copy of the 5-cent Canadian St. Lawrence Seaway stamp with inverted center. This modern printing error, of which only slightly more than 100 are known, including 11 used copies, was discovered in 1959 not long after date of issuance. Widespread interest and limited supply have caused a sharp appreciation for this variety.

A most important single addition to the numismatic collections was received from Cornelius Van Schaak Roosevelt, grandson of President Theodore Roosevelt, who donated a high-relief experimental $20 gold piece dated 1907, owned originally by President Roosevelt. This exceedingly rare and significant piece is one of the first strikings of high-relief $20 gold pieces designed by the American sculptor Augustus Saint-Gaudens at the President's request. It marks a unique venture in modern monetary history, a venture which found the President of the United States and a famous sculptor working together and devoting much of their time and energy to the task of producing a new coin design of real artistic merit. Willis du Pont donated a very significant additional group of Russian coins and medals of the latter part of the 18th century. Mrs. Louise Merrick Schermerhorn presented a group of rare gold certificates including a group of three notes dated 1864, 1866, and 1877, typifying the earliest issues of United States gold certificates. To the section of medallic art were added, as a gift from Norman Stack, two rare Washington medals made in 1790 by Manly and in 1805 by Eccleston. The Medallic Art Company of New York donated an interesting group of models and dies used for the striking of the J. F. Kennedy Inaugural Medal, as well as a process set of medals showing the various steps in the striking and finishing of the medal.

Armed Forces history.—The division of military history received a unique Revolutionary War militia color carried at the Battles of Trenton and Germantown, presented by Francis W. Headman in memory of his son, Francis W. Headman, Jr. A rare Medal of Honor, awarded for gallantry in the siege of Pekin, 1900, was presented by Lt. Col. Calvin P. Titus, the recipient. Fieldwork at Sackets Harbor, N.Y., Fort Adams, Miss., and at underwater sites in Bermuda yielded significant historical materials for the collections. President

John F. Kennedy donated an ancient Greek amphora recovered from the Mediterranean Sea.

Outstanding among the objects received during the year in the division of naval history were collections of German and Japanese ordnance and electronic equipment of World War II, Japanese uniforms, and uniform items of Fleet Admiral Nimitz and Vice Admiral Lockwood. Two items associated with Pearl Harbor were received. A unique monogrammed dish for the Confederate Navy was added to the Civil War collections.

EXPLORATION AND FIELDWORK

Dr. T. Dale Stewart, head curator of anthropology, continued his research in Iraq and during the summer participated in the 1960 Shanidar Expedition sponsored jointly by the Smithsonian Institution and Columbia University. This research extends the collaboration between Dr. Stewart and Dr. Ralph S. Solecki, formerly on the staff of the Smithsonian Institution. Dr. Stewart's participation in this fourth Shanidar expedition was based on the consideration that the skull of No. 2 had been recovered last season but that the rest of the skeleton had been left in situ. After working 6 weeks on this skull in Baghdad, Dr. Stewart went to Shanidar to join Dr. and Mrs. Solecki. They spent 2 weeks uncovering the skeleton of No. 2, which unfortunately proved to be incomplete, consisting only of a few vertebrae and two leg bones. However, at the end of this period more parts of No. 3 were found and almost immediately three new skeletons. When Dr. Stewart left Shanidar in mid-August he was able to take back to Baghdad parts of five Neanderthal skeletons. This continuing exploration, therefore, is turning out to be extremely profitable and future studies of this Neanderthal material may be expected to be of considerable significance.

In the summer of 1960 an interesting discovery was made near Littleton, Colo., of a late Pleistocene bone bed with possible human associations. Because this discovery was of interest both to vertebrate paleontologists and to archeologists, Dr. Waldo R. Wedel, curator of archeology, and Dr. C. Lewis Gazin, curator of vertebrate paleontology, collaborated in outlining a project to the National Science Foundation which has resulted in a grant to make possible a thorough exploration of the Colorado site. To begin this work, in June 1961, Dr. Wedel spent about 2 weeks at the site together with George S. Metcalf, museum aide. The first stages of this digging uncovered some human artifacts and indicated that the subsequent work might be of unusual interest.

Dr. Clifford Evans, associate curator of archeology, and his wife, Dr. Betty J. Meggers, honorary research associate, during the summer of 1960 made a comparative study of certain south American collec-

tions in various European museums. During this period they also participated in the 34th International Congress of Americanists in Vienna and the 6th International Congress of Anthropological and Ethnological Sciences in Paris. In August they engaged in fieldwork in southern France, examining the famous Paleolithic sites that are important to archeologists.

Dr. Gordon D. Gibson, associate curator of ethnology, spent most of the year in ethnological fieldwork and in collecting among the Herero of South West Africa and Bechuanaland. Dr. Gibson returned by way of Egypt and other North African countries in order to obtain material for exhibits in the planning state in a new hall of Asiatic, Pacific, and African ethnology. Since this fieldwork was still in progress at the end of the fiscal year, a more complete account of it will be left for the next annual report.

For a period of about 3½ months, Dr. Eugene I. Knez, associate curator of ethnology, visited numerous museums and conducted fieldwork in various European countries, Pakistan, India, Burma, and other countries of southeastern Asia, Hong Kong, Taiwan, Korea, and Japan to obtain, through local scientists and officials, contemporary ethnological materials for use in a renovated exhibit hall now being prepared in the Museum of Natural History. The work proved to be extremely successful, both in terms of ethnological materials acquired for the exhibit program and personal contacts made with local scientists and scholars.

In the spring of 1960, Dr. Henry W. Setzer, associate curator of mammals, participated in the Smithsonian-Collins expedition to Libya, organized and led by Robert L. Pomeroy and Alan C. Collins. The party traveled overland from Benghazi by way of Cufra Oasis to Faya in northern Tchad, investigating the little-known Tibesti Mountains on the Libyan-Tchad frontier, and returned to the Mediterranean coast by way of Sebha Oasis. In all, they traveled about 5,000 miles, and Dr. Setzer obtained a valuable collection of mammals. En route to join the expedition, he spent a brief period at the British Museum (Natural History) in London, comparing type specimens of various European and African mammals.

Toward the end of the year Dr. Charles O. Handley, Jr., associate curator of mammals, and D. I. Rhymer, office of exhibits, collected in the higher parts of the Clinch Mountains, near Saltville, Va. This exploration was a part of Dr. Handley's continuing studies of mammals of the southeastern United States. The 250 forest mammals obtained complement the large collection of meadow mammals taken in the same region in 1957 by Dr. Handley and associates.

Field studies in the survey of the variation and distribution of the birds of the Isthmus of Panamá under Dr. Alexander Wetmore, honorary research associate and retired Secretary of the Smithsonian

Institution, were continued from January through March. The work began with 10 days devoted mainly to water birds on the lower Río Chagres at Juan Mina. Following this Dr. Wetmore accompanied a party from the Gorgas Memorial Laboratory for Tropical Medicine to eastern Darién. Through cooperation of the air arm of the U.S. Army, the men with their equipment were transferred by helicopter from the town of El Real, on the lower Río Tuira, to Cerro Pirre, where camp was established on the headwaters of the Río Setegantí about 10 kilometers from the Colombian boundary. Birds collected for study skins served also as a source of blood samples to be checked for disease, and of ectoparasites, particularly mites, by other members of the party. The area is one of special interest as the mountain is isolated and has a number of species of South American affinity little known in Panamá.

Most of the remainder of the time available this year was given to studies in the upper basin of the Río Chagres. In mid-February Dr. and Mrs. Wetmore, with two assistants from the Gorgas Laboratory, crossed to the head of Madden Lake by dugout canoe and continued up the Río Boquerón to the mouth of the Quebrada Peluca near the base of Cerro Bruja. Through the kindness of W. H. Esslinger, chief hydrographer, Meteorological and Hydrographic Branch of the Canal Zone, quarters were available here, and also later at Candelaria, in small buildings housing stream gauge equipment for record of runoff waters that feed Madden Lake. At the end of 2 weeks the party moved to the Río Pequení for further studies. Both areas were still heavily forested, with few human inhabitants and fewer trails. Travel was mainly by walking and wading along the beds of streams. Although this was the dry season, rain fell daily. The specimens and notes obtained are especially valuable since this is an intermediate area between the eastern and western sections of the isthmus that has been little known from the standpoint of its biology. The men from the Gorgas Laboratory prepared a considerable series of blood smears and also made collections of biting insects of interest as possible carriers of disease. The season closed with a week at La Jagua in the savanna region east of Pacora.

The division of birds lent the services of Bernard R. Feinstein, museum aide, to the U.S. Army Medical Research and Development Command for much of the year. Mr. Feinstein has been spending the year in South Vietnam collecting with an expedition that is partially sponsored by the Bernice P. Bishop Museum, of Honolulu.

In June, William D. Field, associate curator of insects, spent 2 weeks in field research in the Great Smoky Mountains National Park and other areas of Georgia and South Carolina. Among many valuable additions he made to the national collection of butterflies during the trip, special mention should be made of the very rare species

Strymon kingi and *Megathymus harrisi*, both of which are new to the Museum's collections.

Dr. Oliver S. Flint, Jr., associate curator of insects, spent two periods collecting Trichoptera and related groups for the Museum. In May he obtained collections of such material in the area of New York State near Cornell University in connection with a trip to study museum collections. Early in June he made extensive collections in the vicinity of Highlands, N.C., and other areas of the Great Smoky Mountains and the Blue Ridge. The collections obtained at these localities contained many species and at least two genera not previously in the national collections.

In September Dr. Frederick M. Bayer, associate curator of marine invertebrates, accompanied by Anthony Di Stefano, of the office of exhibits, made a collecting trip to Florida to obtain material and notes for the coral shore exhibit of the Hall of Oceanic Life. Their work was greatly facilitated by the cooperation of the staff of the Marine Laboratory of the University of Miami. Soldier Key, lying 5 miles south of Cape Florida on the south end of Biscayne Key, provided a good representation of the flora and fauna of the coral shore area. The field party made complete photographic notes on the shoreline and shore vegetation, as well as taking a series of underwater photographs. The specimens were taken from the upper, lower, and reef flat platforms, including marine animals, algae, and other plants. Many plaster casts were made in the field and all material obtained was returned to Washington, where it will serve as a basis for the planned exhibit.

In August and September, Charles E. Cutress, Jr., associate curator of marine invertebrates, and Raymond Hays, of the office of exhibits, spent nearly 4 weeks in Oregon collecting specimens and data for a rocky shore habitat group being planned for the Hall of Oceanic Life. An excellent collecting site was found about 6 miles from the Oregon Institute of Marine Biology at Charleston, and the facilities of this Institute enabled the field party to make the best possible use of their time. In addition to obtaining many thousands of specimens of invertebrates, fishes, and plants, the party took numerous color photographs covering the animals and plants collected as well as the site. In addition, sketches and color notations were made in preparation for the proposed exhibit.

In October, Dr. Harald A. Rehder, curator of mollusks, worked in the Pacific area, particularly on Jaluit Atoll, in the southern Marshall Islands. This atoll is of much interest to biologists working in the Pacific because it was nearly completely devastated by a typhoon several years ago. Since that time two or three visits have been made to the area to observe the sequence of events following such a natural disaster. Dr. Rehder explored and studied various islands in the

atoll, their shorelines and reefs, and collected mollusks and other marine life. At the 42 field stations made on the various islands composing the atoll a fairly complete collection of the reef and shallow-water mollusks was made, amounting to thousands of specimens. This collection will give the National Museum a good representation of the reef fauna of the southern Marshalls and will complement existing collections from the other parts of the Marshall Islands.

Between the middle of November and the middle of February, Dr. Joseph P. E. Morrison, associate curator of mollusks, and Thomas G. Baker, of the office of exhibits, made intensive explorations in New Caledonia to acquire specimens and data for a coral-reef group being planned in the new Hall of Oceanic Life. The cooperation of various residents of Noumea, New Caledonia, including staff members of the Oceanographic Institution and the South Pacific Commission, made it possible for them to spend much time on the reefs near Noumea and to make productive dives from small boats. The barrier reef off the coast of New Caledonia presents diverse habitats, and a very rich fauna was observed in many spots. It is anticipated that the materials and photographs returned to the Museum will permit the exhibits staff to design and build an exceptionally fine replica of a Pacific coral reef, although some further exploration may be necessary in order to obtain certain fishes and a few other typical elements of the fauna.

Dr. Richard S. Cowan, associate curator of phanerogams, in mid-June, accompanied by four staff members of the office of exhibits, examined nine sites along the eastern coast of Virginia and North Carolina for the purpose of selecting one that would serve as a basis for constructing a coastal-life group in the future hall of plant science. A large number of photographs were made, sketches and water color paintings of scenes and objects were executed, and the leaves of plants were cast in plaster for future use in our exhibits laboratory.

Dr. Velva E. Rudd, associate curator of phanerogams, spent about 3 weeks in Mexico, where she attended the First Botanical Congress of that country. Subsequently she traveled about 900 miles in Mexico studying the different types of vegetation, such as montane pine forest, cactus, desert, and tropical selva. Specimens were obtained for the National Herbarium, and many botanists in Mexico were encouraged to make collections and send them to Washington for study.

Early in August, Dr. G. A. Cooper, head curator of the department of geology, accompanied by Henry B. Roberts, museum aide, and Dr. Druid Wilson of the U.S. Geological Survey, made a very profitable trip to the vicinity of Hampton, Va., where they collected Miocene fossils along the James River. Two borrow pits were visited, Wilson's Pit and Rice's Pit, which have a great surface from which to collect in contrast to the usual cliff sections found in the Chesapeake Bay area. Consequently hundreds of very fine specimens were

obtained. Perhaps the large areas available for searching account for the fact that a fair number of new species have been turned up from these particular pits.

In September, Dr. George S. Switzer, curator of mineralogy and petrology, accompanied by Paul E. Desautels, associate curator of that division, collected excellent mineralogical material at the Sowerbutt Quarry in the vicinity of Butler, N.J. In August Dr. Switzer visited Norway and Denmark, partly to attend meetings of the International Geological Congress and the International Mineralogical Association in Copenhagen. Before the meeting Dr. Switzer joined a field excursion to mineral occurrences in southern Norway, visiting the Kongsberg silver mines, the serpentine deposits at Modum, the Skutterud cobalt mine, the granite pegmatites of the Iveland district, the Ødegärden phosphate deposits, and the nepheline syenite pegmatites of Langesundfjord.

In February Edward P. Henderson, associate curator of mineralogy and petrology, accompanied by Dr. Chao of the U.S. Geological Survey and Dr. Cohen of the Mellon Institute of Pittsburgh, visited various localities in Georgia that had produced tektites. Five tektite localities were investigated, and it was found that the formation from which these tektites come are more complex than the local geologists had previously thought. Since the Georgia tektites have been chemically dated as being 29 million years old, and this date has been established by two separate investigators, the findings of tektites in different parts of Georgia will make it possible to date accurately some of the widely scattered beds in some sedimentary formations that contain very few fossils.

Dr. Richard S. Boardman, associate curator of invertebrate paleontology and paleobotany, during the summer months visited several European museums and universities studying collections and also explored areas for purposes of collecting. During June he collected invertebrate fossils from many of the classic Lower Paleozoic localities in Britain. These localities include many of the faunas used as standards for comparisons for stratigraphic and geologic time intervals over the world. During July and parts of August and September he collected in Norway and Sweden. The Island of Gotland produced an even ton of remarkably preserved invertebrate fossils, which will provide an important research collection as well as many specimens of exhibit potential.

In connection with the Hall of Invertebrate Paleontology then being renovated, Dr. Porter M. Kier, associate curator of invertebrate paleontology and paleobotany, accompanied by Dr. Erle G. Kauffman, assistant curator of that division, explored Scientists' Cliffs, Md., to obtain sediment from the Miocene outcrop to enable them to reconstruct an echinoid-bearing slab for the echinoderm exhibit. They

also obtained many Miocene mollusks. Early in June Dr. Kier joined Dr. Raymond Douglass, of the U.S. Geological Survey, in Nevada, where they searched for Upper Cambrian carpoids. These are primitive echinoderms, and no specimens as old as the Upper Cambrian have been found outside of one locality in France. Two specimens were located in Nevada, and these are sufficiently well preserved to show characters never before reported in these animals. In the same general area a collection of trilobites was made, and many topotypic corals were obtained from the Pennsylvanian in the vicinity of Ely, Nev.

During the year Dr. Richard Cifelli, associate curator of invertebrate paleontology and paleobotany, made three expeditions in the Atlantic in collaboration with staff members of the Woods Hole Oceanographic Institution. In August he joined the oceanographic vessel *R. V. Crawford*, which then traveled in a southeasterly direction and occupied the same stations that were studied a year earlier by the scientists working from the *R. V. Chain*. Hydrographic observations were made and 200-meter oblique plankton tows were taken at each station. A separate net was used for Foraminifera and a total of 15 samples was collected. After completing work at the last station in the Sargasso Sea, the vessel returned directly to Woods Hole. In January Dr. Cifelli joined the research vessel *R. V. Chain* at Woods Hole and accompanied it along the regular Woods Hole AEC traverse to Bermuda. Despite the cold, windy weather the scientists were able to occupy all the 15 stations along this traverse, and Dr. Cifelli collected a plankton sample for Foraminifera from each. This was his third series from the traverse.

Dr. Cifelli's third trip, also on board the *R. V. Chain*, was in the equatorial Atlantic Ocean. The principal area of investigation was the Romanche Trench. This feature lies on the Equator at about longitude 18° W. and is a region of considerable geologic interest. The depth of the Trench is over 8,000 meters, but in contrast to other ocean deeps it is not situated adjacent to an island chain or continental land mass. Rather, it lies on the Mid-Atlantic Ridge itself. Dr. Cifelli joined the *Chain* in Freetown, Sierra Leone, on April 19 and accompanied it to Woods Hole. Coring, bottom sampling, and bottom dredging were emphasized during this phase of the cruise. The group obtained five cores, six bottom samples, and one dredge. All the cores contained rich layers of Foraminifera and one of them was taken from the deepest part of the trench. In addition, plankton tows were taken every night along the traverse from the Romanche Trench to Woods Hole. Dr. Cifelli obtained 52 plankton samples, which will be a valuable addition to the national collections, since they cover a very large range of latitude.

In August, Dr. Erle G. Kauffman, associate curator of invertebrate paleontology and paleobotany, joined a paleontological expedition sponsored and financed by the University of Michigan. The objective was to obtain vertebrate and invertebrate fossil remains and detailed stratigraphic data from the Upper Cretaceous and the Lower Tertiary coal-bearing formations of the Alaskan interior. Fossils other than those of plants had not previously been recorded from these beds. Beginning work in the vicinity of Healy, Alaska, the group examined in detail every major outcrop of the Tertiary coal-bearing formation and some of the Upper Cretaceous deposits, including the type sections in the Healy-McKinley area. Numerous well-preserved plant fossils were obtained but no animal remains were discovered. A representative flora was returned to the Smithsonian. Cross-bedding studies of the coal-bearing formation were made at many localities, and these studies enabled the group to define more clearly the position and size of the Tertiary coal basins and the direction of transport and source area for the Tertiary Clastic sediments. A final week was spent on the Kenai Peninsula in the vicinity of Homer, Alaska, where beds of the Kenai formation, also a Tertiary coal-bearing deposit, are well exposed in the sea cliffs. Again a search for animal life proved fruitless, although abundant plant fossils were encountered and collected. A great deal of new information concerning the stratigraphy and sedimentology of the Alaskan coal-bearing deposits was gathered, although the principal goal of the expedition, the discovery of fossil animals in these deposits, was not achieved. During a brief trip in July to Brightseat, Md., Dr. Kauffman was accompanied by museum aide Henry B. Roberts. The purpose of this expedition was to study the fauna and stratigraphy of the Upper Cretaceous Monmouth formation and the Brightseat formation and to note the nature of their contact at the type section. More than 3,000 invertebrate specimens were collected, including several species previously unknown from the Maryland Cretaceous and perhaps a few species new to science.

Dr. C. Lewis Gazin, curator of vertebrate paleontology, carried on extended research in Europe. In addition to studying historic fossil collections in many European museums and attending the International Geological Congress at Copenhagen and various paleontological symposia, Dr. Gazin also visited various collecting localities and obtained important material for the national collections. In France he visited the various collecting sites for Paleocene mammals in the Cernay area and all the known quarries where Sparnacian or Lower Eocene mammals have been found. He also worked at the Cormeilles Quarry near Paris, where a remarkable display of Early Tertiary horizons from the Ludian or Gypse de Paris through the Sannoisian to the Stampian could be seen. This is very near Sannois, the type locality for the Sannoisian Lower Oligocene. In Spain, in the vicinity

of Barcelona, Dr. Gazin visited important localities where strata are exposed from the Eocene to the Pliocene. Although the local collections are essentially from the Upper Tertiary, a surprising amount of Eocene, generally regarded as barren, is exposed in the area.

A party consisting of Dr. Nicholas Hotton, 3d, associate curator of vertebrate paleontology, Kurt Hauschildt, museum aide, and Dr. Frank C. Whitmore, of the U.S. Geological Survey, made two expeditions during the year to Hampton, Va., to collect portions of a whale skeleton from the Yorktown formation. They collected the following parts of the whale: Right mandible, right maxilla, two complete ribs, about 15 vertebrae representing thoracic, lumbar, and caudal regions, and assorted small bones, mostly chevrons. This skeleton has been tentatively identified as that of a species of *Balaenoptera.* It lay about 8 feet below the top of the Yorktown (Miocene) formation as exposed at the site.

In November, Dr. Hotton collected vertebrates of Mississippian age and prospected other Mississippian localities at Greer, W. Va., and vicinity. He was accompanied by William E. Moran, formerly a member of the staff of the division of vertebrate paleontology. The Mississippian Period is of critical importance in the study of tetrapod evolution, since it marks the time of the initial radiation of the amphibians and the probable origins of the reptiles. Unfortunately, most Mississippian sediments are of marine origin, so that the rarity of terrestrial deposits of that age makes them doubly important. Three quarries were visited and much material of significance was obtained, including a partial skeleton of an embolomerous amphibian. In February Dr. Hotton left for South Africa for a collecting season in the famous Permian Karroo beds. In this work he was furnished every accommodation by his colleagues at the University of Witwatersrand in Johannesburg. Considerable success was achieved in obtaining many skulls and other skeletal portions of a variety of Permian and Triassic vertebrate forms, none of which were previously represented in the collections of the Smithsonian Institution.

Staff members of the Museum of History and Technology visited many museums in the United States and abroad during the year, mostly to observe exhibit techniques or to procure materials for exhibition in the new building. The fieldwork of these staff members generally involves trips of this sort, or visits to numerous individuals and institutions about the country in an attempt to procure exhibit materials or to learn something about developments that will be useful in the Smithsonian's expanding efforts.

For a week in September, John C. Ewers, Assistant Director of the Museum of History and Technology, was able to renew his research interests in the Blackfeet Indians in Montana. Many changes have taken place since he last visited the Blackfeet Reservation in

1953. Among these have been a rapid decline in the use of the Blackfeet language by the Indians, the virtual disappearance of living links between the traditional buffalo-hunting culture and the present, the probable discontinuance of the tribal sun dance in 1959, the transference of Indian education from Indian Service schools to public schools of the State of Montana, and the abolition of Indian prohibition followed by the opening of several taverns in the town of Browning. Mr. Ewers obtained pertinent information which enabled him to bring up to date his studies of the history of the Blackfeet arts and crafts.

During the last half of August and early September Mendel L. Peterson, head curator of armed forces history, explored underwater sites in Bermuda. He took part in an investigation of four shipwreck sites, three of which dated from the 17th century and the fourth from the early 19th century. A collection of several hundred objects was recovered and forwarded to the Smithsonian. The most interesting wreck site examined is believed to be that of the *San Antonio*, a ship of the Spanish treasure fleet which was wrecked on the southwestern reefs of Bermuda in 1621. Outstanding among the hundreds of objects recovered are two wine jars of different shape and size in perfect condition. Both are of extremely rare types. Additional items recovered were money cowries, blue glass trade beads, tanbark, tanned leather, a very large number of red-ware shards, Talavera shards, and some jars of numerous shapes. Among the ordnance materials found were solid iron shot of two sizes, an extremely rare stone shot, small spheroid pebbles used in swivel guns, and three varieties of wire musket shot believed to be unique. A second ship investigated was the *Sea Venture*, which was wrecked in 1609 and resulted in the settlement of Bermuda. There is no doubt about the identity of this ship; an irrefutable chain of evidence has been discovered on the site, and the location of the wreck and circumstances of its stranding coincide perfectly with eyewitness accounts of the event. The two remaining ships are the *Virginia Merchant*, destroyed in 1660, and the *Caesar*, an English merchant ship bound for Baltimore that struck reefs southwest of Bermuda in 1818.

EXHIBITIONS

In the introductory statement of this Report the work completed in the Smithsonian's exhibits-modernization in the past 8 years has been summarized. Twenty-two National Museum halls are described in some detail in that recapitulation. It therefore seems appropriate here to record only a few additional details that pertain particularly to events of the past year.

During the year six modernized exhibition halls were opened to the public.

609118—61——4

The third and last section of the textile hall gallery, presenting the origin and history of lacemaking and rugmaking and popular types of American needlework, was completed for public inspection on December 9, 1960. Included in this display are old American quilts, samplers dating from the 18th and 19th centuries, laces beginning with 16th-century drawnwork and also machine-made laces of the 19th century, and needlework handkerchiefs.

The completely renovated Hall of Monetary History and Medallic Art was formally opened in the Arts and Industries Building on March 18, 1961, in the presence of the Secretary of the Treasury, the Under Secretary of the Treasury, Senator Clinton P. Anderson and Representative Frank T. Bow, Regents of the Smithsonian Institution, members of the diplomatic corps, donors, collectors, and representatives of numismatic organizations from all sections of the United States. The central series of 19 specially designed cases traces the major aspects of the development of money economy from primitive barter to the establishment of our modern monetary system. The hall also features the world's largest collection of gold coins, given to the Smithsonian Institution by the late Paul A. Straub. Almost 4,000 silver coins complement this series.

The story of life through the ages from the oldest known fossils, dated 1,600 million years ago, to the Cenozoic Era mammals is depicted in three halls in the Natural History Building. The synoptic display of fossil plants features those that contributed to the formation of coal. Fossil backboneless animals such as sponges, corals, snails, clams, trilobites, and other extinct shelled animals are shown in geological time sequence. The second hall, that of fossil fishes and amphibians was informally opened in June 1960. This year a life-sized group was completed, showing an encounter between two kinds of pelycosaurs, or fin-backed reptiles, as it might have happened about 260 million years ago. The third hall, the Age of Mammals in North America, traces the succession of mammals in the five epochs of Tertiary time from Paleocene to Pliocene, a period of 70 million years. Skeletons of the better-known groups of mammals are supplemented by a display of skulls for each of these epochs. The large mural painting by Jay H. Matternes depicting some of the characteristic mammals with contemporary reptiles and plants of the Bridger middle Eocene has been completed, and a second mural, showing a Harrisonian or early Miocene life assemblage of mammals, is nearly finished. These three halls were formally opened to the public on the night of June 6, 1961.

The first of two modernized halls of North American Archeology was opened to the public on June 24, 1961. A number of the 34 exhibits in this hall portray and explain important aspects of aboriginal North American life. About half of the exhibits in the hall inter-

pret the prehistoric cultures of the North American Arctic, the North Pacific Coast, California, and the Southwest by means of selected artifacts, graphic materials, and life-sized and miniature groups.

A temporary meteorite exhibit, placed in the areaway connecting the jade room and this archeology hall on the second floor of the Natural History Building, was also opened to the public on June 24, 1961.

The modernized Hall of Petroleum, adjoining the iron and steel exhibit in the Arts and Industries Building, provides a brief historical account of the growth of the petroleum industry since the discovery of the Drake well at Titusville, Pa., in 1859. This hall, completed in June 1961, features animated models showing the two earliest methods of drilling employed in the United States—the springpole and the Drake rig. A small display of geophysical exploration equipment, made possible by the generosity of Seimos GmbH, Humble Oil Co., Continental Oil Co., Schlumberger, and Everett Lee DeGolyer, Jr., reviews the principal methods employed to expand knowledge of America's oil resources. With the cooperation of Standard Oil Co. (Indiana), Universal Oil Products Co., Esso Standard Oil Co., M. W. Kellogg Co., C. P. Dubbs, and the Massachusetts Institute of Technology (Prof. Harold Weber), an account of the major developments in oil refining is presented. The experimental still used by Drs. Burton and Humphries at Whiting, Ind., which led to the first large-scale thermal cracking of crude, was graciously donated to the Museum by Dr. Robert Wilson. A polymerization plant model shows one of the earliest processes for increasing the high-octane content of gasoline, which was important in making fuel available for the allied air forces in 1939–40. The historic fluid-catalytic cracking process which was evolved in 1941 to provide the best qualities of fuel needed by the U.S. Air Force is also shown, as well as a platinum-catalyst reforming process demonstrated as a sample of the postwar effort to convert lower-grade to a higher-grade fuel.

Construction of Hall 8, in which will be displayed the material culture of the peoples of the Pacific Islands and South and Southeast Asia, was completed in May 1961. New construction was commenced in the adjacent Hall 7, which will contain the exhibits for the peoples of Africa and eastern Asia. Continued progress was made on the contractual construction of the large west hall fixtures for the display of oceanic life. Architect's plans for the modernization of the large east Hall 2, which will contain the dinosaurs and the Mesozoic reptiles, were completed and the construction contract let in June 1961.

At the end of the eighth year of the continuing modernization of exhibits program, 9 of the 15 galleries on the first floor and 4 second-

floor halls in the Natural History Building have been renovated and opened to public view.

Curatorial planning of exhibits for the large Hall of Oceanic Life, now under construction, comprised the major exhibits project of the department of zoology during the year. All members of the curatorial staffs of the divisions of fishes, marine invertebrates, and mollusks were actively engaged in this project, and those of the divisions of mammals and reptiles and amphibians were involved to some extent. Four field trips have been made to collect materials for this hall. Dr. Joseph P. E. Morrison and James Watson obtained materials for the marshy-shore and sandy-beach groups near Ocean Spring, Miss., and Beaufort, N.C. For the Pacific coast rock-shore and tidepool habitat group, Charles W. Cutress, Jr., and Raymond E. Hays visited Cape Arago, Oreg. Coral-shore specimens were collected by Dr. Frederick M. Bayer and Anthony DiStefano at Soldier Key off Miami, Fla. Dr. Morrison and Thomas G. Baker gathered material and information for the coral-reef exhibit in New Caledonia. Five casts of fishes near record size have been donated by Al Pflueger of North Miami, Fla.

Because of the necessarily long period of time during which the large east Hall 2 and the northeast Hall 6 will be closed, a selection of dinosaurs and Pleistocene animals of popular interest has been placed on display in the rotunda of the Natural History Building.

During the year 16 new exhibits interpreting the history of medicine, dentistry, and pharmacy were installed on the east gallery of the Arts and Industries Building, bringing the total of modernized exhibits in the field of medical sciences to 28. These new displays illustrate the practice of bloodletting through the ages, the development of surgical anesthesia, spectacles, medicine chests, antique drug jars, tools of the apothecary, and dental instruments. A new exhibit on the eye was installed in the hall of health.

A special exhibition of the "geophysical globe," a new relief globe of superior accuracy, was held in the rotunda of the Arts and Industries Building during April 1961. A diorama prepared for exhibition in the hall of electricity of the Museum of History and Technology, depicting the broadcast of a program from the studio of KDKA (one of the pioneer commercial broadcasting stations in the world) during the winter of 1921–22, was placed on public display. A special exhibition, featuring the model of the 1819 steamship *Savannah*, was displayed in the watercraft hall in celebration of National Maritime Week, May 21–27, 1961. The locomotive "Pioneer," which served the Cumberland Valley Railroad in 1851, was placed on exhibition in the east hall of the Arts and Industries Building in February 1961. Two landmark machine tools of 1865–75, completely restored and made operative by William Henson, were placed on exhibition in the south-

west gallery of the Arts and Industries Building. The first, a No. 1 Brown and Sharpe Universal Milling Machine, is set up to mill the flutes of twist drills, which was one of the first operations undertaken by this type of machine. The other tool, a Jones and Lamson turret lathe, is equipped with authentically reconstructed turret tools to produce brass oil cups. A temporary exhibition of fine prints, drawings, and photographs of 18th- and 19th-century civil engineering works, planned by Associate Curator Robert M. Vogel, was displayed from February 1 to April 30, 1961. A particularly attractive display of decorative watches was installed in the hall of timekeeping and the Schlage antique lock collection was shown for a period of 2 months in the rotunda of the Arts and Industries Building.

An experimental fuel cell tractor, developed by the Allis-Chalmers Manufacturing Co., was placed on special display in the hall of farm machinery in October 1960. Throughout the year a rotating exhibition of color photographs lent by the Soil Conservation Service of the U.S. Department of Agriculture was maintained at the east end of this hall.

A special exhibit featuring 250 masterpieces of ancient Greek coinage, prepared by Mrs. Clain-Stefanelli from material lent by a private collector, was displayed from December 1960 to March 11, 1961, in the rotunda of the Arts and Industries Building and from March 18 to May 26, 1961, in the monetary history hall. Several small temporary exhibits of a topical nature were arranged by the division of political history. An inaugural exhibit was displayed from December 1960 to March 1961, and during the same period state gifts presented to President Eisenhower were shown. Early voting machines and presidential commemorative material were exhibited during February 1961. During the year the White House china collection expanded so that representative pieces from almost every administration are now on exhibition. A selected group of historical items from the Postal History Museum of the Post Office Department, which was transferred to the Smithsonian Institution April 1, 1961, was placed on exhibition in the philately hall. On May 26, 1961, a rare American wooden statue of William Pitt, carved in 1801 by Joseph Wilson for the eccentric "Lord" Timothy Dexter of Newburyport, Mass., a gift of Mrs. Arthur M. Greenwood, was placed on exhibition in the cultural history hall. From January 15 to February 5, 1961, the first public showing of the recently acquired Harry T. Peter's "America on Stone" lithography collection was held in the foyer of the Natural History Building.

A complete display of United States military decorations and medals, and a Civil War 12-pounder gun on its carriage were added to the existing displays in the hall of military history. A number of warship models, relating particularly to the Civil War, were added

to the exhibits in the hall of naval history, while other models were progressively retired for major restoration. This restoration normally involves complete repainting and re-rigging, and frequently requires extensive research in the interest of detailed historical accuracy.

During the month of September 1960 a special exhibition of memorabilia of Gen. John J. Pershing was placed on view in the rotunda of the Arts and Industries Building in conjunction with the national celebration of General Pershing's birth. Roman antiquities recovered from the Mediterrranean and the Sea of Galilee by the Link expedition during the previous summer were displayed from April 1 to April 26, 1961. The division of military history prepared a special exhibition of military epaulets for the annual meeting of the Company of Military Collectors and Historians which was held May 19–21, 1961, at Gettysburg, Pa.

Dr. A. C. Smith, Director of the Museum of Natural History, assumed the chairmanship of the committee coordinating and supervising the modernization of the natural history exhibits following the retirement of Dr. Herbert Friedmann as head curator of zoology. Dr. Friedmann served with distinction as a member of the exhibits planning committee since its formation in 1950, and played an active and substantial role in the organization and development of the exhibits modernization program.

The major objective of the exhibits program of the Museum of History and Technology, which is being coordinated by Assistant Director John C. Ewers, is the development of exhibits for the new building now under construction. Many of the exhibits destined for future display in this new museum building are now being installed in the Arts and Industries Building until the Museum of History and Technology Building is completed for occupancy. Exhibits for a number of halls in this new building were prepared in the exhibits laboratory and carefully stored until they can be installed. These included displays for the halls of costumes, political history, ceramics, everyday life in the American past, physics, railroads, Armed Forces history, and ordnance.

Exhibits Chief John E. Anglim provided the over-all supervision of exhibits for the United States National Museum. The exhibits work for the Museum of History and Technology was supervised by Benjamin W. Lawless, with the assistance of Robert Widder in design, Bela S. Bory in production, and Robert Klinger in the model shop. Rolland O. Hower, assisted by Thomas G. Baker and Julius Tretick, supervised the renovation of exhibition halls in the Museum of Natural History. The design of the modernized halls in existing buildings has been greatly aided by Richard S. Johnson, design branch chief, and John H. Morrissey, architectural branch chief of the architectural and structural division of the Public Buildings Service, General Serv-

ices Administration, and by Luther H. Flouton, Charles J. Nora, and Julius J. Dickerson, design architects of that agency. Carroll Lusk, museum lighting specialist of Syracuse, N.Y., provided valuable consultative assistance to designers of exhibition halls for the Museum of History and Technology. George Weiner, with the assistance of Constance Minkin, Basil Andronicos, and Edna Owens, continued the editing of the curator's drafts of exhibit labels.

DOCENT SERVICE

The Junior League of Washington continued its outstanding volunteer guided tour program for schools within the Greater Washington area, with the cooperation of G. Carroll Lindsay, curator of the Smithsonian Museum Service, working with Mrs. Dean Cowie, chairman of the Smithsonian Volunteer Committee of the Junior League of Washington, and Mrs. E. Tillman Stirling, cochairman. At the conclusion of the tour season Mrs. Cowie was succeeded as chairman by her cochairman, Mrs. Stirling. Mrs. Vernon Knight will serve as cochairman of the Docent Committee for the forthcoming year.

During the 1960–61 season, tours were conducted in the Halls of Everyday Life in Early America, Native Peoples of the Americas, Gems and Minerals, Textiles, and Power. Tours in each of the halls were scheduled twice each day, 5 days a week from October through January. In February tours were offered four times daily in the Halls of Everyday Life in Early America and Native Peoples of the Americas, while they were continued in the other three halls on the same schedule of twice daily. Tours were conducted through April.

A total of 579 tours were conducted, in which 16,207 children participated. This represents a marked increase over last year's participation. It is important to express in this report the deep gratitude of all connected with the Smithsonian for the notable service to the community and the Institution given by these able and dedicated volunteer workers.

In addition to Mrs. Cowie and Mrs. Stirling, the members of the Docent Committee were: Mrs. George Armstrong, Mrs. A. Stuart Baldwin, Mrs. William Dixon, Mrs. William Ford, Mrs. Clark Gearhart, Mrs. George Gerber, Mrs. Everett Hutchinson, Mrs. Charles Kelly, Mrs. Vernon Knight, Mrs. Edward Lamont, Mrs. Ralph Lee III, Mrs. Dickson Loos, Mrs. John E. Malone, Mrs. John Manfuso, Mrs. Ernest May, Mrs. William McClure, Mrs. Robert McCormick, Mrs. Arnold McKinnon, Mrs. Peter Macdonald, Mrs. Joseph Metcalf, Mrs. William Minshall, Mrs. Minot Mulligan, Mrs. James Rasbury, Mrs. Robert Rogers, Mrs. W. James Sears, Mrs. William Sloan, Mrs. Walter Slowinski, Mrs. James Stallings, Mrs. John Voorhees, Mrs. Richard Wallis, and Mrs. Marc White.

BUILDINGS AND EQUIPMENT

On May 19, 1961, the cornerstone of the Museum of History and Technology was laid, with the Regents of the Smithsonian Institution and members of the Joint Congressional Committee participating in placing the mortar for the stone. The Honorable Earl Warren, Chief Justice of the United States Supreme Court and Chancellor of the Smithsonian Institution, together with Senator Clinton P. Anderson, Regent of the Smithsonian Institution and Chairman of the Joint Congressional Committee for the Museum of History and Technology, spoke of the history and purpose of the new building. At the close of the fiscal year the building was approximately 50 percent complete.

A contract was awarded for the construction of the east wing extension as well as alterations and air conditioning of the existing Natural History Building January 3, 1961, to the George Hyman Construction Co. Construction was started January 6, 1961, and the project on June 30, 1961 was 17.5 percent complete. This east wing extension will provide 195,000 net square feet of needed space for workrooms and laboratories for the scientific work of the Museum of Natural History.

In the Museum of Natural History, an additional 1,152 square feet of floor area has been added to the division of marine invertebrates by the installation of second-floor levels in rooms 82, 83, and 83B. Additional lighting, utilities, and air-conditioning equipment have been provided. A second-floor level has been installed in the supply division stockroom adding approximately 1,496 square feet to this area. The mineral hall has been repainted and the floor in the jade hall has been restored to its original finish. The deteriorated plaster in the north stairway has been removed and replaced, and all surfaces have been repainted. Additional space has been provided for the exhibits laboratory in the west court.

In the Arts and Industries Building, all loose, damaged plaster has been removed from the north entrance, surfaces replastered, and the entire area repainted. The hall of military history has been completely redecorated.

The buildings management department furnished the custodial and mechanical services which included the installation of needed new doors, rewiring exhibit cases, and the improvement of the security alarm system.

CHANGES IN ORGANIZATION AND STAFF

Effective June 16, 1961, the title of the division of industrial cooperation in the department of arts and manufactures within the Museum of History and Technology of the United States National Museum was changed to the division of manufactures and heavy industries.

Frank M. Setzler, head curator of the department of anthropology, retired December 31, 1960, after 30 years service. Dr. Herbert Friedmann, head curator of the department of zoology, retired May 31, 1961, after 32 years service. Dr. Friedmann is now director of the Los Angeles County Museum.

Charles G. Dorman, assistant curator of political history, transferred to the National Park Service, effective July 9, 1960. Dr. David H. Dunkle, associate curator of vertebrate paleontology, transferred to the U.S. Geological Survey on September 18, 1960. Dr. Anthony N. B. Garvan, head curator of the department of history, resigned October 16, 1960, to accept a professorship at the University of Pennsylvania. John D. Shortridge, associate curator of cultural history, resigned June 1, 1961. Eugene S. Ferguson, curator of mechanical and civil engineering, resigned June 23, 1961, to accept a professorship at Iowa State University, Ames, Iowa. Dr. William J. King, curator of electricity, resigned June 23, 1961, to accept an appointment with the American Institute of Physics, New York City.

Dr. Richard H. Howland was appointed head curator of the department of civil history, effective November 7, 1960. The head curator vacancy in the department of anthropology was filled by the promotion of Dr. T. Dale Stewart, effective March 5, 1961. Eugene N. Ostroff accepted an appointment as associate curator in charge of the section of photography, division of graphic arts, on July 25, 1960. Dr. Oliver S. Flint, Jr., was appointed associate curator of insects, effective January 1, 1961. Dr. Thomas R. Soderstrom was appointed effective October 3, 1960, assistant curator of grasses.

Respectfully submitted.

REMINGTON KELLOGG, *Director.*

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, 1961, 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 a portion of the year to general supervision of the activities of the Bureau and the River Basin Surveys. In midsummer he inspected the work of excavating parties operating in the Big Bend and Oahe Reservoir areas in South Dakota and a portion of the Oahe Basin in North Dakota, as well as a field party working in the Wilson Reservoir area in Kansas. Three of the parties represented the River Basin Surveys and three were from cooperating agencies. In addition, Dr. Roberts visited one excavation that was not a part of the salvage program. The work at that location consisted of investigations in the remains of Fort Kearney, Nebr., a historic army post being studied by the Nebraska State Historical Society. During part of the trip Dr. Roberts was accompanied by Dr. John M. Corbett and Carroll A. Burroughs of the Washington office of the National Park Service, and during the entire trip by Paul L. Beaubien, regional archeologist, Region Three, National Park Service. While at Pierre, S. Dak., the group took part in an informal conference attended by leaders of all the parties and many of their student helpers working in the Plains during the summer. A wide range of archeological problems in the Missouri Basin was discussed.

In September Dr. Roberts went to Mesa Verde National Park where he served as chairman of the Advisory Group for the Wetherill Mesa Project, a cooperative undertaking between the National Park Service and the National Geographic Society. The group spent 3 days discussing and inspecting the excavations underway in two large cliff ruins and studied the operations of the field laboratory handling

the materials recovered during the digging. Recommendations were made pertaining to the continuance of the investigations and improvements in the handling and cataloging of specimens.

In November Dr. Roberts went to Norman, Okla., to attend the Plains Conference for Archeology and participate in discussions relating to the history of the Indians in that general area.

Early in April at Mule Creek, Wyo., Dr. Roberts made arrangements for establishing a camp and starting a series of excavations in a Paleo-Indian site—a cooperative project between the National Geographic Society and the Smithsonian Institution. Upon the completion of these activities he proceeded to Lawton, Okla., where he was the principal speaker at the dedication of the Museum for the Great Plains on April 9. Returning to the Washington office, he began preparations for sending a field party to the site at Mule Creek and in that connection left Washington early in June for Lincoln, Nebr., where he was joined by Dr. William M. Bass, who was to be the chief field assistant, and several other members of the party. They picked up two vehicles and field equipment and proceeded to Mule Creek to set up camp, and on June 12 began excavations. Dr. Roberts remained with the party until June 19. The party, however, continued operations under Dr. Bass and was busy digging at the end of the fiscal year. As a result of the work up to that time an extensive deposit of bison bones, probably representing an extinct species, and a number of artifacts have been recovered. The site is one that dates about 9,000 years ago.

Dr. Roberts completed a manuscript, "The Agate Basin Complex," which is to be published in Mexico in a volume containing articles about the Paleo-Indian. He also did the technical editing of a series of seven reports on archeological excavations and studies in three reservoir areas, to appear in Bulletin 185 of the Bureau of American Ethnology.

At the beginning of the fiscal year, Dr. Henry B. Collins, anthropologist, was in Europe studying collections in the principal museums and attending two international anthropological congresses. He visited Lascaux and a number of other Paleolithic cave and rock shelter sites in the Dordogne region of France and examined Megalithic sites and monuments in the Morbihan and Finistere districts of Brittany. Dr. Collins attended the 34th International Congress of Americanists in Vienna, July 18–25, and the 6th International Congress of Anthropological and Ethnological Sciences in Paris, July 30-August 6. At the latter he presented a paper discussing the present status of evidence bearing on the origin of Eskimo culture.

Dr. Collins continued to participate in the activities of the Arctic Institute of North Amercia as a member of its Board of Governors, as a member of the Publications Committee that supervises prepara-

tion of the journal *Arctic* and two other publication series, and of the Research Committee that plans and supervises the Institute's extensive program of Arctic research. He also continued to serve as chairman of the Directing Committee responsible for preparation of the Arctic Institute's *Arctic Bibliography*, a comprehensive work which abstracts and indexes the contents of publications in all fields of science, and in all languages, pertaining to the Arctic and sub-Arctic regions of the world. Volume 9 of *Arctic Bibliography* (1,599 pages), containing abstracts of 7,192 scientific publications on the Arctic, was published in September 1960. Of the publications abstracted in this volume, 3,170 had appeared in English, 2,548 in Russian, 790 in Swedish, Norwegian, and Danish, 338 in German, and 346 in other languages. Volume 10, similar in size and content to volume 9, is in press, and work is proceeding on volume 11.

The project which Dr. Collins organized last year for the purpose of translating Russian publications on the archeology, ethnology, and physical anthropology of northern Eurasia made progress under the editorship of Dr. Henry N. Michael of Temple University. The first volume to be completed is S. I. Rudenko's "The Ancient Culture of the Bering Sea Area and the Eskimo Problem," the only comprehensive Russian work on the archeology of northeastern Siberia. It is now in press and will appear as the first number in a special publication series of the Arctic Institute of North America. The Advisory Committee, of which Dr. Collins is chairman, has selected material—monographs and shorter papers—for five additional volumes which are now being translated. The work is being carried out with the support of a grant from the National Science Foundation.

Dr. Collins prepared a paper on the interrelationships of early Eskimo and pre-Eskimo cultures in Alaska, Canada, and Greenland and their affinities with Temperate Zone cultures in America and Asia to be published in a volume of the *Special Publications* series of the Arctic Institute of North America, and another paper on the environmental factors involved in the origin and development of Eskimo culture in the American Arctic.

Dr. William C. Sturtevant, ethnologist, spent July and August 1960 in Europe. He attended the 34th International Congress of Americanists in Vienna and the 6th International Congress of Anthropological and Ethnological Sciences in Paris. The remainder of the period was spent in museum research. In 11 museums of England, Austria, France, the Netherlands, and Sweden Dr. Sturtevant studied several hundred early specimens collected from eastern North American Indians. He located, described, and photographed many important specimens and collections, mostly from the northeast—there are surprisingly few early southeastern specimens in Europe. To one familiar with collections in the United States the number and good

condition of early northeastern Indian objects in Europe are striking.

A secondary objective of Dr. Sturtevant's study in Europe was a search for possible European prototypes of modern eastern North American Indian artifacts. Although he visited seven museums of peasant and folklore materials, this project was less successful than the first, both because of time limitations and because European collecting and research in some important categories of artifacts (e.g., basketry) are insufficiently developed.

In November 1960, Dr. Sturtevant attended an informal conference on Iroquois research in New Haven, Conn., the annual meeting of the Southern Historical Association in Tulsa, Okla. (where he delivered a paper on "History, Ethnohistory, and Folk History: Seminole Examples"), and the American Indian Ethnohistoric Conference in Bloomington, Ind. He also visited several museums and archival collections in Oklahoma City, Norman, and Tulsa. There are several important collections of southeastern Indian artifacts and documents in Oklahoma.

Dr. Sturtevant also continued his research on various tribes of eastern North America. His paper "The Significance of Ethnological Similarities between Southeastern North America and the Antilles" was issued as Yale University Publications in Anthropology No. 64 (1960), and shorter comments by him appeared in Bureau of American Ethnology Bulletin 180 and in Current Anthropology, vol. 2, No. 3 (both 1961). A somewhat revised version of his "Anthropology as a Career" (Smithsonian Publication 4343) was issued October 7, 1960.

Dr. Wallace L. Chafe, linguist, completed work on two manuscripts. One of them, "Seneca Thanksgiving Rituals," which is in press as Bureau of American Ethnology Bulletin 183, contains important Seneca religious texts, as well as transcriptions of the music that accompanies one of the rituals. The other, "Handbook of the Seneca Language," a nontechnical description of Seneca orthography and grammar with an extensive glossary of Seneca terms encountered in the anthropological literature, will be published as a Bulletin of the New York State Museum. Dr. Chafe also continued the preparation of a Seneca dictionary.

Beginning in October, Dr. Chafe mailed over 600 questionnaires in a survey of the approximate numbers and ages of speakers of the extant North American Indian languages. These were addressed to individuals who have had contact with the various Indian groups. The responses have been numerous and informative, and efforts are now being made to fill in the gaps. Fieldwork for the project is being conducted in cooperation with the American Philosophical Society.

Dr. Chafe spent considerable time throughout the year processing Arikara and Caddo linguistic material already collected and preparing

to do further fieldwork on Caddo. He was also fortunate in being able to do some work with a speaker of Oklahoma Cherokee living in Washington.

RIVER BASIN SURVEYS

The River Basin Surveys, a 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 and the Corps of Engineers of the Department of the Army in the Inter-Agency Archeological and Paleontological Salvage Program, continued its activities throughout the year. Attention was directed to areas that are to be flooded or otherwise destroyed by the construction of large dams in the various river systems of the United States. The year's investigations were supported by a transfer of $123,895 from the National Park Service to the Smithsonian Institution. Of that sum, $103,895 was for work in the Missouri Basin and $20,000 for studies along the Chattahoochee River in Alabama and Georgia. On July 1, 1960, the Missouri Basin Project had a carryover of $9,420, and that, with the new appropriation, provided a total of $113,315 for the Missouri Basin Project. The grand total of funds available in 1960–61 for the River Basin Surveys was $133,315.

Activities in the field were mainly concerned with excavations, although there were some limited surveys in two areas. The funds available for the last fiscal year were slightly greater than those for the preceding one, but because of increased costs there was little gain in the amount of work accomplished. On July 1, 1960, there were three excavating parties working in the Missouri Basin in South Dakota. One of them was digging sites in the Big Bend Reservoir area, and the other two were working in the Oahe Reservoir area farther north. The Missouri Basin parties completed their field activities the latter part of August and returned to the headquarters at Lincoln, Nebr.

In September a party resumed explorations and excavations along the Chattahoochee River in Alabama and subsequently extended its efforts to the Georgia side of the river in the Walter F. George Reservoir area. Work continued there until the end of December. During October a small party spent a brief period investigating a site that was being destroyed by gravel operations in the upper reaches of the Big Bend Reservoir area in South Dakota and also collected material from the immediate construction areas of the Big Bend Dam.

The 1961 field season got under way in May, when a small party went to the Merritt Reservoir area in Nebraska to make a final check on possible archeological manifestations at that location. Two previous surveys there had failed to reveal cultural materials, but it was thought that because of shifting sand dunes and construction activities something previously missed might have been uncovered. Nothing

of that nature was found, and the party moved to the Big Bend area in South Dakota where it was expanded and began a series of excavations in some burial mounds. A second party went to the Big Bend area on June 13 and started excavations in a large village site on the west side of the river 4 miles above the dam site. A third party started working on the west side of the Missouri River in the Oahe Reservoir Basin on June 19. It was digging in a large village site located about 5 miles south of Mobridge, S. Dak. All three parties had the season's program well under way and were busily digging at the close of the fiscal year. During the fiscal year, 11 parties representing institutions cooperating in the Missouri Basin program worked in four reservoir areas in Kansas, Nebraska, and South Dakota. There were 24 parties from cooperating institutions working in other basins throughout the country.

As of June 30, 1961, the River Basin Surveys had carried on reconnaissance work or had excavated in 255 reservoir basins located in 29 States. In addition, two lock projects and four canal areas have been examined. During the years since the program got under way 4,952 sites have been located and recorded, and of that number 1,157 were recommended for excavation or limited testing. Because complete excavation has not been possible in any but a few exceptionally small ones, when the term "excavation" is used it implies digging only as much of a site as is thought essential to provide a reasonable sample of the materials and information to be found there. Preliminary appraisal reports have been issued for most of the reservoir areas which were surveyed. In some cases no archeological manifestations were noted and no general report was issued. During the past fiscal year no new reconnaissance work was undertaken and no such reports were distributed.

By the end of the fiscal year, 519 sites in 54 reservoir areas located in 19 different States had either been tested or dug sufficiently to provide good information about them. The sites in which digging has been done cover a wide range of cultural characteristics. Some of them pertain to early hunting and gathering peoples of about 10,000 years ago, while others represent communities lived in by early historic Indians and the remains of frontier, army, and trading posts of European origin. Between the two extremes are a series of sites attributable to sedentary horticultural groups extending from approximately the 6th to the 13th centuries A.D.

Reports on the work have been published in the Smithsonian Institution Miscellaneous Collections, in Bulletins of the Bureau of American Ethnology, and in various scientific journals and historical quarterlies. Bulletin 176, containing River Basin Surveys Papers Nos. 15–20, was distributed in December 1960. These papers consist of a series of reports on historic sites excavated in the Garrison, Oahe,

and Fort Randall Reservoir areas in North and South Dakota. Bulletin 179, containing River Basin Surveys Papers Nos. 21–24, a series of reports on work in Texas, Iowa, and along the Columbia River, is in proof form and should be distributed in the early part of the next fiscal year. The papers in that Bulletin were listed in the report for 1959–60 and need no further comment here. During the year, River Basin Surveys Paper No. 25, a report on the "Archeology of the John H. Kerr Reservoir Basin, Roanoke River, Virginia-North Carolina," by Carl F. Miller, was sent to the printer and will appear as Bulletin 182. Another series of River Basin Surveys Papers, Nos. 26–32, to comprise Bulletin 185, was edited and sent to the printer in June. These reports are: "Small Sites in and about Fort Berthold Indian Reservation, Garrison Reservoir, North Dakota" and "Star Village: A Fortified Historic Arikara Site in Mercer County, North Dakota," by George Metcalf; "The Dance Hall of the Santee Bottoms on the Fort Berthold Reservation, Garrison Reservoir, North Dakota," by Donald D. Hartle; "Crow-Flies-High (32MZ1), a Historic Hidatsa Village in the Garrison Reservoir Area, North Dakota," by Carling Malouf; "The Stutsman Focus: An Aboriginal Culture Complex in the Jamestown Reservoir Area, North Dakota," by Richard P. Wheeler; "Archeological Manifestations in the Toole County Section of the Tiber Reservoir Basin, Montana," by Carl F. Miller; "Archeological Salvage Investigations in the Lovewell Reservoir Area, Kansas," by Robert W. Neuman.

The figures showing the distribution of reservoir projects throughout the country and those in which excavations have been made did not change during the current fiscal year and for that reason need not be repeated. Readers desiring that information can obtain it by referring to the Bureau's 77th Annual Report, for the fiscal year 1959–60. The excavations conducted during the present fiscal year were all in reservoir areas previously listed. Figures pertaining to the work done by State and local institutions under agreements with the National Park Service have not been included in recent reports because complete information about them is not available in the River Basin Surveys office.

The River Basin Surveys received helpful cooperation throughout the year from the National Park Service, the Bureau of Reclamation, the Corps of Engineers and other army personnel, and from various State and local institutions. The field personnel of all the cooperating agencies assisted the party leaders in numerous ways, and in all areas the relationship was excellent. Both in Washington and in the field the National Park Service continued to serve as a liaison between the various agencies. It also was responsible for the preparation of estimates and justifications for the funds needed to carry on the salvage program. The Commanding Officer at Fort Benning

in Georgia provided valuable assistance in numerous ways while investigations were being made in the portion of the Walter F. George Reservoir basin which lies in the Fort Benning Reservation. In addition, the Georgia Historical Commission, the University of Georgia, and various local clubs and groups of citizens in both Alabama and Georgia assisted the leader of the River Basin Surveys party while he was working along the Chattahoochee River. In the Missouri Basin the project engineers for the Oahe Reservoir provided space for temporary living accommodations and also for the storage of equipment. In a number of cases the construction agency lent mechanical equipment which was most helpful in the stripping of the topsoil from sites and the backfilling of trenches and test pits. In the Missouri Basin the Corps of Engineers also cooperated with the staff of the Missouri Basin Project of the River Basin Surveys in the preparation of a number of small informative pamphlets telling about several of the reservoirs along the Missouri River.

General supervision of the program was from the main office in Washington, but the activities in the Missouri Basin operated from the field headquarters and laboratory at Lincoln, Nebr. At the beginning of the year the latter provided office assistance and some equipment for the Chattahoochee River Project, but subsequently most of that activity was transferred to the main office in Washington. The Lincoln laboratory processed all the materials collected by excavating parties in the Missouri Basin and also some of those from the Chattahoochee.

Washington office.—Dr. Frank H. H. Roberts, Jr., continued to direct the main headquarters of the River Basin Surveys at the Bureau of American Ethnology throughout the year. Carl F. Miller, archeologist, was based at that office and from time to time assisted the Director in some of the general administrative problems. Harold A. Huscher, archeologist, worked under the general supervision of the Washington office, but at the beginning of the fiscal year was based on the field headquarters for the Missouri Basin Project at Lincoln, Nebr. After completing his field activities along the Chattahoochee River, Alabama-Georgia, in late December, he joined the Washington office and continued to work there the remainder of the fiscal year.

Mr. Miller spent the entire time in the Washington office working on materials and data he had collected during previous seasons in the field. He spoke before various groups interested in archeological subjects and answered numerous inquiries pertaining to artifacts and cultural materials from the southeastern archeological area. He also identified artifacts from 15 collections of southeastern material. In October he attended the sessions of the Eastern States Archeological Federation in Toronto, Canada, and in May he presented a paper on

609118—61——5

"The Archeology of the Clarksville Site, 44 Mc 14, Mecklenburg County, Virginia," before a joint session of the Archeological Societies of Virginia and North Carolina held at Clarksville. He completed a short paper, "The Physical Structure of Rock Mound at 9 ST 3, Georgia," which was published in Southern Indian Studies, vol. 11, pp. 16–19. Mr. Miller furnished data that were used in the preparation of the "Ethnological Map of Virginia," which was published by Hearn Brothers, Detroit, Mich.

At the beginning of the fiscal year Harold A. Huscher, while on annual leave, assisted Dr. Richard G. Forbis, Glenbow Foundation, Calgary, Alberta, in the excavation of the remains of a fortified earth-lodge village at Cluny in the Blackfoot Reserve on the Bow River about 65 miles east of Calgary. Returning from Canada he drove south by way of the front ranges and the high plains, visiting a number of the more important Early Man-type sites, such as those at Sagecreek and Agate Basin in Wyoming, Dent and Apex Spring in Colorado, and Homo Novusmundus in New Mexico. In mid-August he returned to duty at Lincoln, Nebr., where he made preparations for resuming the archeological investigations in the Walter F. George Dam and Lock area along the Chattahoochee River. Shortly after his arrival at Eufaula, Ala., at the end of August, he started his fieldwork. After returning to the Washington office in January he devoted his time to bringing up to date the several years' backlog of maps and field notes pertaining to the Chattahoochee investigations. In May the processed collections of the two previous years' fieldwork in Alabama-Georgia were moved from Lincoln to Washington for storage at the U.S. National Museum, and Mr. Huscher proceeded to combine that material with the collections he had made during the current season. At the close of the fiscal year he was busy selecting bone and shell specimens and items pertaining to the early colonial period for identification by various Smithsonian specialists.

Alabama-Georgia.—During the period from mid-September to the end of December Harold A. Huscher, using a power-driven screen of ⅜-inch mesh and a small crew of local laborers, tested a series of 15 sites below Eufaula, Ala., in the southwestern quadrant of the Walter F. George Reservoir Basin. Most of the sites fall into two general classes. The first group consists of those with a predominance of Mississippian pottery, characterized by the early Mississippian globular pots with loop handles, comparable to the Macon Plateau types in Georgia and the Gordon types in Tennessee. Such pottery actually has a long time span, continuing down to the opening of the historic period (Pinellas, Fort Walton). The second group includes sites with an overlay of late Creek pottery such as the Chattahoochee Brushed variants and Kasihta Red-film in association with trade metal, china, and glass.

Most major sites in this reservoir, however, are proving to be in the multiple-component category with several time levels represented. The stratification is usually gradational rather than sharply demarcated, hence the digging is by arbitrary levels. At sites favorably located on the terrace points near stream junctions, underlying Early Woodland and Archaic manifestations usually will be definitely identifiable, though not sharply separable, at depths of 2.0–5.0 feet below the present surface. The following are the most important sites investigated during the fall season:

The Spann's Landing site, 1HE34, is located in Alabama 3 miles above the dam axis, in a loop of the Chattahoochee River opposite Grace's Bend, and a little more than a mile below the Mandeville Mound site (1CLA1) [1] in Clay County, Ga. This site extends for more than 800 feet along the crest of a low natural levee, with the greatest concentration of material at the north or upstream end. A series of 14 squares 10-x-10 feet were laid out there in two rows, so spaced as to give an adequately distributed sampling. Of the 14 squares, 8 pits were actually dug, to varying depths down to 5.0 feet. There is a sparse overlay of brushed pottery, indicating some use of the area during the Late Creek period, but the most intense occupation was during Mississippian times, and probably fairly early Mississippian times, as indicated by the pottery remains. One productive cache pit yielded parts of several pots of the Pinellas arcaded ware ("pumpkin pot," "melon pot"), a type described from Florida and attributed to a late peripheral Mississippian manifestation. It is, however, considered diagnostic of a possibly earlier Mississippian period as described by Caldwell for the great Rood's Landing site (9SW1), 30 miles farther north, and the Mississippian cap on the large Mandeville Mound (Stark's Clay Landing, 9CLA1), as reported by McMichael and Kellar. Along the Chattahoochee the arcaded pots with temper and handle variants may have a much longer time range, apparently continuous, than in Florida, extending back to the earlier Macon Plateau period, with the Singer-Moye site (9SW2), south of Lumpkin on the headwaters of Pataula Creek, one of the earliest major sites. At depths of 2.5–4.0 feet below the present surface at Spann's Landing, fiber-tempered pottery comparable to the Stallings Island and Orange Plain types of the latest Archaic and earliest

[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.

Woodland occurred consistently, as well as early point types, the latter regularly consisting of the decomposed flint first described from the Macon area by Kelly.

1HE51, a site in Alabama at the junction of Hardridge Creek and the Chattahoochee River, 2.5 miles above the dam axis, was tested by six 10-foot squares, ranging in depth down to 5 feet. The predominant occupation there was Early Woodland, with fiber-tempered, Deptford, and Swift Creek pottery types recognized. However, no productive pit area was located. A number of large, heavy-stemmed projectile points, again in the decomposed flint characteristic of the Archaic in this area, were recovered from the deeper levels. Several less important sites near Hardridge Creek were tested by from one to six 10-foot squares, to obtain a broad spectrum sample of the range of pottery in the area. One site, 1HE56, yielded a number of sherds of all-over fingernail-incised pottery, the only site where this specialty has risen to a significant frequency.

Somewhat farther north, between White Oak and Cheneyhatchee Creeks, another series of sites was tested in order to check on exposures of Chattahoochee Brushed pottery, since a Late Creek village, Okitiyakni, had supposedly been somewhere in the general area. 1BR46, 47, and 2A were found to yield significant amounts of brushed pottery, and one area of pits was located at 46. There a large fragment of a restorable pot, which agrees closely with published descriptions of the Late Creek ware from the Southeast and from Oklahoma, was found in direct association with trade metal. Eleven squares in all were dug at these sites, but no structural remains were identified. Eight 10-x-10-foot squares were dug at five other nearby locations, but information recovered was less important. One site at the south side of Barbour Creek (1BR10) was checked by four 10-x-10-foot squares, and consistently found to yield Gulf Woodland forms, some in direct association with a level of basin-shaped hearths. One of the latter was filled with irregular fist-sized fragments of burned clay, possibly fired for use as cooking "stones" or to provide pottery temper.

In November 1960 an immediate salvage job became necessary on Hatcheechubbee Creek, in Russell County, Ala., some 17 miles north of Eufaula, where a highway relocation project was destroying an Early Woodland site, 1RU74. Known as the Kite site, it was discovered in 1959 by Sergeant David W. Chase. It lay on a point of terrace between the creek and a small unnamed spring branch from the north. There four 10-foot squares were laid out parallel to the right-of-way and taken down to depths up to 5 feet. The upper layers yielded several types of Early Woodland sherds of the Deptford and Swift Creek series, and a considerable range of thick fiber-tempered sherds (Stallings, Orange) was obtained at slightly lower

levels. A series of stone artifacts was obtained in the deeper part of the tests. They consisted of the very characteristic decomposed flint of the Archaic. Several burned rock areas were noted, but no pits were found. The site, though not rich, was interesting in that there was much less intrusion from above, with the close mixing of time periods that makes some of the larger, more productive sites so confusing.

Beginning November 19, the remaining time was devoted to work on two mound sites. Trenched previously, they were 9QU1, and 9QU5, south of Georgetown, Ga., in Quitman County.

9QU1, Moore's "Mounds near Georgetown, Quitman County, Georgia" (Mounds of Lower Chattahoochee and Lower Flint Rivers, Journ. Acad. Nat. Sci. Philadelphia, 2d ser. vol. 13, pt. 3, pp. 426-456, 448), locally called the "Gary's Fishpond Mound" or the "Gary's Fishpond Site," consists of extensive village remains and a large low mound, now almost completely plowed down and carried away. The site was tested in the spring of 1960 by digging a T-trench along the east margin of the mound, and seven 10-x-10-foot trenches in the adjacent village areas. Although actually only the roots of the mound are left, it appeared desirable to attempt to determine more exactly the period of its building. Since the outwash apron of the mound was found to be intact, it seemed the site offered an opportunity for getting direct separation of mound, mound fill, and pre-mound periods, with the additional prospect of locating separate pits or features that would give individual "pure" samples.

The original grid was reset and a larger area in the western half of the mound remnants was stripped, revealing the roots of a circular mound faced with clay. It probably was originally about 200 feet in circumference at the base. A section trench cut through the western margin revealed that the clay facing had been carefully built up at a steep angle. The actual base of the mound was about 4 feet below the present surface in this area. A palisade of spaced large-diameter posts followed just outside the curve of this clay wall, but the posts did not appear to have been set into the wall. The indications were of some sort of a clay-faced "caracol" type mound. Additional bedding lines outside the circular periphery indicated a possibility that some kind of overlying rectangular mound had been built on the core of the original circular mound. An area 20-x-20 feet was excavated in mottled fill in the calculated center of the circular mound revealing numbers of post holes in interrupted alignments, running NW.–SE. and NE.–SW., though no clearly defined structure could be made out. Because of increasing inclemency of the weather the planned excavation of this center pit down into the submound could not be completed in the available time and the site was closed down.

However, additional work is certainly indicated for that location and will be scheduled for the early part of the new field season.

Several lots of midden excavated in the central 20-x-20-foot pit contain a high frequency of a carefully finished plain ware with thickened rims and no handles. This does not seem to be the local Weeden Island type, but may be evidence of contacts with or an actual occupation of the site by Early Mississippian peoples carrying a culture somewhat like that which becomes Coles Creek and Moundville farther west. If such were the case, the overlying rectangular structure would then relate to the later Fort Walton-Lamar period which seems to account for the greater part of the pottery from this site. The one recognizable structural pattern found, other than the mound, was located in the nearby village and consisted of large post holes at spaced intervals, outlining a corner and two adjacent walls of what was probably a house of the later period.

Additional work was done at 9QU5, a site referred to locally as the "Mound on the Lower Lampley Place" or the "Mound below Cool Branch." For brevity the site and mound will be referred to as the "Cool Branch Mound Site." This site had been tested previously by a 5-foot trench from the east margin to the approximate center of the mound. The mound proper was built of basket-loaded clay, apparently at one single stage of building, and there was a submound post-hole pattern indicating some sort of premound building.

Thirteen additional 10-x-10-foot test pits were dug at this site, eight in an east-west line across the north margin, paralleling the edge of the terrace, and five bracketing the mound proper. Using a tractor scraper, the surface of the mound was stripped, revealing the approximate edges of a regular rectangular clay-platform mound, with the corners oriented to the cardinal points. The mound was then bulldozed away to a level approximately 0.5 foot above the contact of the clay mound with the underlying river-silt surface of the terrace, as determined in the previous trenching. The center of the mound was then cleared by hand shoveling, revealing the post holes of a rectangular submound structure of closely set posts, corners closed, approximately 27-x-36 feet over all. This building was oriented with the overlying mound, though lying partly outside the baseline on the northwest side. As nearly as could be determined from the bulldozed surface without actually tracing out the lines by shoveling, the southwest margin being the least certain, the original base dimensions of the mound were about 55-x-55 feet. At the center of the submound structure was a pile of red iron ore (hematite) probably representing a symbolic ceremonial fire. The sand beneath was stained red but did not seem actually to have been burned. Two beautiful spud celts, one of a fine-grained greenstone, were found together in the mound fill about a foot above the contact. Both had been broken by the bull-

dozing. The spud is commonly found in Mississippian mound sites westward to the Mississippi River.

A 5-x-10-foot test below the actual submound level revealed wall trenches of a rectangular open-cornered building, oriented NE.-SW., and in one of the series of 10-x-10-foot trenches, 75 feet southeast of the main mound, a straight section of wall trench was found. These features could not be examined further in the time available. Another test 400 feet northwest of the mound center and about 100 feet back from the terrace edge, also uncovered a house-wall trench at depths of 1.5 to 2.0 feet. Using a tractor, about a thousand square feet were stripped, tracing out the wall lines, but time did not permit complete study of the patterns. Rectangular, open-cornered houses, closely spaced but apparently not adjoining, were arranged in rows running NE.-SW. Hearths appeared to be in the forecourt to the southeast, rather than within the houses. No clearly defined occupation floor could be identified, hence the associations are not certain. Most of the pottery from that part of the site seems earlier than the houses, which presumably slightly antedate the mound, but continue into the mound period, since there is no evidence of a later house type. House evidence is so difficult to obtain along the Chattahoochee River, however, that negative evidence cannot be relied upon, and the known house areas at this site should be excavated further to get as complete house plan evidence as possible.

During the field season parties from the University of Alabama and the University of Georgia, under agreements with the National Park Service, also worked at sites in the Walter F. George Reservoir area.

Missouri River Basin—For the fifteenth consecutive year the Missouri Basin Project continued to operate from the field headquarters and laboratory in Lincoln, Nebr. Dr. Robert L. Stephenson served as chief of the project throughout the year. Activities included surveys, excavations, analysis of materials, and reporting on results. During the summer months the work was mainly concerned with excavations. Analyses and preparation of reports received the major attention throughout the other months of the year. The special chronology program begun in January 1958 continued to receive attention.

At the beginning of the fiscal year the permanent staff, in addition to the chief, consisted of 3 archeologists, 1 administrative assistant, 1 clerk-stenographer, 1 illustrator, 1 file clerk on the permanent staff, and 12 crewmen on the temporary staff. One paleontologist, on loan from the National Park Service, was added to the temporary staff for a month for the purpose of analyzing nonhuman bone material from the sites excavated over the past three seasons. In June, 2 assistant field archeologists, 1 cook, and 25 field crewmen were added to the temporary staff.

At the end of the fiscal year there were 3 archeologists in addition to the chief, 1 administrative assistant, 1 administrative clerk, 1 secretary, 1 scientific illustrator, 1 photographer, and 4 museum aides on the permanent staff, and 2 assistant field archeologists, 1 cook, and 25 field crewmen on the temporary staff.

During the year there were 10 Smithsonian Institution River Basin Surveys field parties at work in the Missouri Basin. Three of these were in the Oahe Reservoir area and two were in the Big Bend Reservoir area of South Dakota during July and August. One small field party conducted investigations during October and November in the Big Bend Reservoir area. One party investigated the Merritt Reservoir area in Nebraska during May and June. Two parties were excavating in the Big Bend Reservoir area and one in the Oahe Reservoir area during June.

Other fieldwork in the Missouri Basin during the year included 11 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.

There was a slight increase in appropriated funds for fiscal year 1961, but since most of the new money was to cover wage-scale increases beginning in July, the fiscal situation brought into even sharper focus than before the critical problem of accomplishing the minimum necessary salvage at a time when two of the largest reservoirs, Big Bend and Oahe, were nearing completion and, in fact, Oahe was beginning to flood some of the important unexcavated archeological sites. However, when the parties took to the field in June it was possible to shift the methods of fieldwork from sampling of large numbers of sites back to the intensive excavation of a smaller number of key sites. The sampling techniques of the preceding two field seasons had been successful but some of the more intensive excavations were again needed.

At the beginning of the fiscal year, Dr. Warren W. Caldwell and a crew of eight were engaged in minor test excavations at two sites in the Big Bend Reservoir of South Dakota. Site 39LM222, near the mouth of Medicine Creek, in Lyman County, was a diffuse village of the La Roche complex. A small, circular house with closely spaced wall posts, four center posts, and a long entry passage, lay just above an earlier structure of indeterminate pattern. A shallow ditch surrounding the deeper house suggested that the house itself may have formed a bastion, or strong point, in the fortification system. Segments of both superimposed houses were excavated. Portions of a third house were also dug and it proved to have been a small, circular building differing little in structural details from the uppermost of the two superimposed houses. Pottery and other artifacts were

1. Use of power screen speeds testing of sites in Walter F. George Reservoir area, Alabama. River Basin Surveys.

2. Tracing bottom edge of large mound along Chattahoochee River in Georgia. River Basin Surveys.

1. Floor pit for rectangular earth lodge in Oahe Reservoir area, South Dakota. Remains of posts are visible along left wall. River Basin Surveys.

2. Excavating base of low mound in Oahe Reservoir area in North Dakota. Bison remains buried with human bodies may be seen at left. Traces of logs at right cover human skeletons. River Basin Surveys.

homogenous throughout the site, indicating a single La Roche-Iona-Russell Ware tradition and but one occupation. This would place the village in the late sedentary-farmer period of the 15th to 17th centuries. The second site of the group, 39LM224, is located but a mile downstream from 39LM222, and represented another La Roche village of diffuse pattern, but with only four houses apparent from the surface. One of them, a burned circular structure with widely spaced wall posts and long entry passage was partially excavated.

On July 19, Dr. Caldwell moved to the Oahe Reservoir area in old Armstrong County (now a part of Dewey County), above the mouth of the Cheyenne River on the west bank of the Missouri, and hired a new crew of laborers. The Oahe Reservoir, already beginning to flood, had begun to cover some of the sites in that vicinity. One of those still above water was site 39AR201, the remains of a large compact village of 18 long-rectangular houses placed in rows but without apparent fortifications. The remnants of one of the structures were excavated and other tests were made in the site. This extremely long, narrow house had been nearly twice as long as it was wide and its ruins were covered by 4.5 feet of overburden. There had been a low bench along the rear wall into which a shallow trench had been dug to receive the rear wall posts. Dentalium, native copper, and abundant human bone scraps lay on the floor and an ochre-covered human bundle burial associated with a bison skull was found in the southeast corner. Pottery was consistently Thomas Riggs Ware. This site represented a village of the Thomas Riggs Focus of middle-period sedentary farmers in the Missouri Valley and may date from the 15th century. Less than 500 yards downstream the remains of another large Thomas Riggs village, site 39AR210, were tested and found to resemble 39AR201 in all respects except that there had been a rectangular, bastioned fortification system. This site had been flooded by the Oahe Reservoir and reexposed by a drop in the water level. Recovery of archeological details was minimal, owing to their having been obscured by the flood waters, but a good artifact sample was collected. The Caldwell party completed the season's work after 9 weeks in the field.

The third River Basin Surveys party in the field at the beginning of the year, consisting of a crew of six under the direction of Robert W. Neuman, was excavating at the Boundary Mound site (32SI1) on the North Dakota-South Dakota boundary line in the Oahe Reservoir area, Sioux County, N. Dak. The site consisted of four dome-shaped burial mounds, ranging from 3 to 5 feet in height and 60 to 80 feet in diameter. Three of the mounds were excavated. Each contained a rectangular central burial pit covered with timbers and lined with matting. Bison remains (skulls, partial skeletons, and complete skeletons in articulation) were found around the timbers. The burial

609118—61——6

pits were 3 to 4½ feet deep and contained from 6 to 14 secondary human burials, the bones of several being coated with red pigment. Artifacts were generally associated with a single individual in each pit. They included side-notched projectile points, triangular knives, bipointed drills, an obsidian end scraper, sandstone atlatl weights, a catlinite object, cigar-shaped bone objects, tubular bone beads, bone awls, a bone pendant, a bear canine pendant, shell pendants, and worked human mandibles as well as those from dogs and beaver. This mound group comprised burial tumuli of the Woodland period with relationships to the east and southeast of the area. They probably date from the period of 1,500 years ago and earlier.

The Neuman party continued investigations in other burial-mound sites along the right bank of the Missouri River between Mandan, N. Dak., and Mobridge, S. Dak. Site 32M0207 is a group of three mounds in Morton County, N. Dak., some 20 miles south of Mandan. One of them was excavated but yielded only a single secondary human burial and no artifacts. The Schmidt site (32M020) is a group of eight burial mounds 12 miles south of Mandan in Morton County. One mound, 75 feet in diameter and 1.3 feet high, was excavated. It contained a single secondary human burial in a rectangular, central, timber-covered burial pit. Articulated bison bones lay near the charred timbers that had covered the pit. The only artifacts recovered were a few fragmentary stone tools from the surface near one of the unexcavated mounds. The Swift Bird site (39DW233) is a group of two burial mounds and three shallow, circular depressions. One of the mounds, 70 feet in diameter and 3 feet high, was excavated. A single primary burial lay on the mound floor. Artifacts associated with the burial include dentalium beads, a tubular bone bead, and a shell pendant in the shape of a thunderbird. It is of interest to note that no pottery was found in association with any of these burial mounds. The Neuman party completed the season's work on September 1, after 12 weeks in the field.

The fourth Missouri Basin Project field party at work at the beginning of the fiscal year was a crew of three, under the direction of G. Hubert Smith, investigating historic sites in the Oahe Reservoir area. Activities at the site of Fort Sully (39SL45) in Sully County consisted of excavations of building foundations and refuse dumps and latrine pits in several parts of the site. Pits dug near the hospital and the barroom locations were particularly informative. The excavations provided detailed outlines of some of the main structures of this military post of the 1866–94 period. They also produced one of the largest known collections, obtained under controlled conditions, of military and civil objects of this period. Especially noteworthy is a large array of glassware, including "art glass," hundreds of bottles, medical-department glassware, and household glass. Many of these objects

are complete or little damaged and are marked as to origin or purpose. Objects of earthenware in great quantity, including Oriental earthenware, and numerous items of metal and leather were recovered. Strictly military objects are in the minority but unusual items of both military and civilian use will form a valuable comparative collection and future exhibit material. Even specimens of printer's type, for printing official orders, were found.

Investigations at the site of Fort Bennett (1870–91) in Stanley County, directly opposite Fort Sully, having been abandoned in June owing to flooding by the Oahe Reservoir, were resumed in August when the pool level had receded somewhat. The site was uncovered but the ground was so thoroughly waterlogged that excavation was impractical. Photographs were take for record purposes and some historic specimens were collected. The experience gained there, as at other flooded sites, clearly emphasizes the hopelessness, in a great majority of cases, of trying to do archeological work in sites that have once been flooded and reexposed when the waters receded, whether the sites in question be historic or prehistoric.

On August 10 the fifth Missouri Basin Project field party, consisting of Smith and his crew, moved into the Big Bend Reservoir area to conduct preliminary tests at site 39ST202, believed to be that of Fort George, a trading post of the 1840's. Only the scantiest contemporary record of this post has been found, although it was visited by Audubon and is reputed to have been of some importance as an opposition post in the fur trade. Tests there located former log habitations and occupational debris of the period. The site is located in Stanley County at the northeast corner of the Brule Indian Reservation. This field party also took charge of an emergency excavation of six human burials accidentally located by construction activities at the Big Bend Dam site and reported by the Corps of Engineers. The interments were in wooden coffins and contained glass beads and other late objects suggesting the early reservation period, though no record of such graves has been found. The Smith party completed 9 weeks in the field and returned to Lincoln August 19.

During the period October 26 to November 6, one Missouri Basin Project field party investigated a site being destroyed by gravel operations in the upper reaches of the Big Bend Reservoir area. Robert W. Neuman and a crew of two examined and tested the areas of the Arzberger site (39HU6), which were being cut away as a gravel quarry. A rich midden and several cache pits were exposed and excavated. Artifacts were collected and data compiled, but there appeared to be little material that had not already been discussed in a report on this site. During the same period Neuman also made a flight over the lower portion of the Oahe Reservoir and took aerial photos of several sites that had been flooded and reexposed by a drop

in the pool level. On the return trip to Lincoln this party also visited sites in the immediate construction area of the Big Bend Dam (at the request of the Corps of Engineers) and while there collected specimens for dendrochronological use. It also visited an earth-lodge village site near Wessington Springs, S. Dak., and examined several amateur collections in southwest Minnesota and northwest Iowa.

The 1961 summer field season in the Missouri River Basin began in the Merritt Reservoir area on May 25. Robert W. Neuman and an assistant spent 11 days in a final intensive search of the flood-pool area of this dam on the Snake River in Cherry County, Nebr. The dam is well along in construction and, despite two previous surveys that provided very little archeological evidence, it was thought that a final investigation should be made. The shifting sand dunes in this area, combined with the construction activities, might have revealed some cultural remains of the earlier periods. Such was found not to be the case and no archeological manifestations were noted. This reservoir area can be written off as completed.

The second Missouri Basin Project field party consisted of a crew of nine under the direction of Robert W. Neuman. This party began work on June 6 in the construction area of the Big Bend Reservoir (actually the upper reaches of the Fort Randall Reservoir) at site 39BF225. At that location there is a group of three low burial mounds situated on the terrace just west of the Talking Crow site (39BF3) in Buffalo County, S. Dak. By the end of the fiscal year Neuman had trenched two of these mounds and found three components present: (a) Historic with coffin burials, (b) the mound component with secondary pit burials, and (c) a premound, nonceramic component.

The third Missouri Basin Project field party of the season was composed of a crew of 10 directed by Dr. Warren W. Caldwell. It began work on June 13 at the Pretty Head site (39LM232). This site is located on the right bank of the Missouri River, 4 miles above the Big Bend Dam site in Lyman County, S. Dak. By the end of the year excavations were well under way in several middens, and in the remains of one long-rectangular house.

The fourth Missouri Basin Project field party of the 1961 season was a crew of 10 directed by Dr. Robert L. Stephenson. This party began work on June 19 in the upper reaches of the Oahe Reservoir in Corson County, S. Dak., on the west side of the Missouri River some 5 miles south of Mobridge. There a series of small sites extending from the Blue Blanket Island site (39WW9) downstream into Dewey County to site 39DW232 was to be investigated with intensive excavations at the Potts Village site (39CO19) and the Le Compte Creek site (39DW234). The latter are the remains of circular house villages with fortifications and suggest a possible link between the later

part of the long-rectangular-house period and the earlier part of the circular-house period. The two main sites each appear to have a single bastion in the fortification system. Excavations were well underway by the end of the year.

Cooperating institutions working in the Missouri Basin at the beginning of the fiscal year included five field parties from State agencies in North Dakota, South Dakota, Nebraska, Kansas, and Missouri. W. Raymond Wood of the University of Oregon had a crew at work for the State Historical Society of North Dakota at the Huff site (32M011) in the upper reaches of the Oahe Reservoir some 18 miles below Mandan, N. Dak. Wood's party excavated eight houses and 200 feet of palisade, and cross-sectioned the fortification ditch. This was the location of a fortified, bastioned village of long-rectangular houses with the houses loosely arranged in rows. One unusual house was nearly square and had four center posts comparable to the circular houses of other sites. Dr. Preston Holder of the University of Nebraska had a crew at work at the Leavenworth site (39C09), 7 miles north of Mobridge in Corson County, S. Dak., in the Oahe Reservoir. This site, visited by Lewis and Clark in 1804 and attacked by Col. Henry Leavenworth in 1823, was an Arikara village (or pair of villages) of circular houses. Holder's crew excavated four houses and tested several midden areas. Dr. Wesley R. Hurt, Jr., with a University of South Dakota crew, spent July and August excavating portions of the No Heart Creek site (39AR2) in old Armstrong County on the right bank of the Missouri River in the Oahe Reservoir. This small, compact, fortified, La Roche-type village had an unusual series of small bastions and entryways. Thomas A. Witty with a crew from the Kansas State Historical Society excavated four sites and tested several others in the Wilson Reservoir area on the Saline River in Russell and Lincoln Counties, Kans. All four excavated sites relate to the Central Plains Phase. Dr. Carl H. Chapman had a University of Missouri crew in the field surveying and testing sites in the Kasinger Bluff Reservoir on the Osage River in Henry, Benton, and St. Clair Counties, west-central Missouri.

At the end of the fiscal year six field parties representing four cooperating institutions were in the field in the Missouri Basin. Dr. Preston Holder was back at the Leavenworth site (39C09) in the Oahe Reservoir for a second season of work by the University of Nebraska. Dr. Carl H. Chapman was back at the Kasinger Bluff Reservoir in Missouri with a University of Missouri field party surveying and testing sites in that area. In addition, Chapman had a survey crew at work in the Stockton Reservoir area in Cedar and Dade Counties, Mo. Thomas A. Witty had a crew at work excavating the Woods site (14CY30) and testing several other sites in the Milford Reservoir on the Republican River in Geary County, Kans., for the Kansas

State Historical Society. Dr. Wesley R. Hurt had a crew at work by boat, testing several sites being exposed by wave action along the shores of Lewis and Clark Lake (Gavins Point) and Fort Randall Reservoirs, for the University of South Dakota. Roger T. Grange had a crew from the Nebraska State Historical Society at work in the Red Willow Reservoir area in Frontier County, southwestern Nebraska, excavating two sites near the dam construction area. All the parties mentioned above were operating under agreements with the National Park Service and were cooperating with the Smithsonian Institution in the research program.

During the time that the archeologists were not in the field they were engaged in the analysis of their materials and in the laboratory and library research. They also prepared manuscripts of technical scientific reports and wrote articles and papers of a more popular nature.

The Missouri Basin Chronology Program, begun by the staff archeologists of the Missouri Basin Project in January 1958, continued to operate and made considerable progress throughout the year. Continued cooperation and participation by more than 30 individuals representing 30 research institutions throughout the Plains area has been rewarding. This year major emphasis was placed upon the dendrochronological section of the program. Harry E. Weakly of the U.S. Department of Agriculture, Dr. Warren W. Caldwell of the Missouri Basin Project, and Ward Weakly of the University of Nebraska concentrated the tree-ring studies on a limited area along the Missouri River between Fort Thompson and the Cheyenne River in South Dakota. This takes in all the Big Bend Reservoir area and the lower portions of the Oahe Reservoir. A master chart has been constructed for this area using oak, ash, and cedar, that extends from the present back to A.D. 1302. Archeological wood, mainly cedar house posts, from a number of sites has been dated by the master chart. The dates look good, and in general correlate well with other chronological data, but until further checks have been made, release of these dates would be premature. In addition to the master chart, a "floating" sequence of nearly 300 years has been constructed, based upon timbers from houses of the Over Focus and the Thomas Riggs Focus. There also appears to be a high degree of correlation between the South Dakota master chart and the several charts that have been previously developed for areas of Nebraska.

The radioactive carbon-14 section of the program has continued to develop, and in conjunction with the University of Michigan Memorial Phoenix Laboratory, under the direction of Prof. H. R. Crane, a series of four new dates has been released. *Sample M–1079a*, charcoal from a house post of the late component at the Crow Creek site (39BF11) in the Fort Randall Reservoir, S. Dak., excavated by

Marvin F. Kivett for the Nebraska State Historical Society as a part of the Inter-Agency Archeological Salvage Program, gave a date of 560±150 years ago. *Sample M–1080a*, charcoal from Feature 4 of the Good Soldier site (39LM238) in the Big Bend Reservoir of South Dakota, gave a date of 2,380±150 years ago. This sample was excavated by Robert W. Neuman of the Missouri Basin Project staff. *Sample M–1081*, charcoal from zone D of the Logan Creek site (25BT3) in northeastern Nebraska, excavated by Marvin F. Kivett for the Nebraska State Historical Society, gave a date of 7,250±300 years ago. *Sample M–1082*, wood from a house post in a small long-rectangular house (F. 2) of the Fay Tolton site (39ST11) in the Oahe Reservoir, gave a date of 860±150 years ago. This sample was excavated by Dr. Donald D. Hartle, then of the Missouri Basin Project staff. An experiment in the decontamination of charcoal treated with paraffin failed completely. A log, one end of which had been coated with paraffin and the other end not so treated, had had the treated end deparaffined and both sections were run for carbon-14 analysis. The two dates from the same piece of charred wood were several centuries apart.

The laboratory and office staff spent its full effort during the year in processing specimen materials for study, photographing and illustrating specimens, preparing specimen records, and typing, filing, and illustrating record and manuscript materials. Accomplishments of the laboratory and office staff are listed in tables 1 and 2.

The Missouri Basin Project staff archeologists and archeologists of the National Park Service and cooperating States agencies working in the Missouri Basin met on July 30 in a roundtable field conference in Pierre, S. Dak. This 17½th Plains Conference, now a regular summer event, and a supplement to the annual Thanksgiving Plains Conference, was devoted to discussions of current fieldwork and technical problems of field identifications. During the Thanksgiving weekend, members of the staff participated in the 18th Plains Conference for Archeology, held in Norman, Okla. On April 14, members of the staff participated in the seventy-first annual meeting of the Nebraska Academy of Sciences in Lincoln.

Dr. Robert L. Stephenson, Chief, devoted a large part of his time during the year to managing the office and laboratory in Lincoln and preparing plans and budgets for the 1961 field season. He compiled a 7-volume summary of construction data and archeological work in all the 789 named reservoir sites in the Missouri Basin for use in future planning in the Lincoln office. He completed the revision of a large technical monograph, "The Accokeek Creek Site: A Middle Atlantic Seaboard Culture Sequence," previously accepted as his doctoral dissertation at the University of Michigan, and continued with preliminary analysis of materials he recovered from the excavations

at the Sully site (39SL4) in the Oahe Reservoir in 1956–57–58. He also continued work on a monograph reporting the "Archeological Investigations in the Whitney Reservoir, Texas," and two smaller manuscripts, all nearing completion at the end of the year. Throughout the year he served as chairman of the Missouri Basin Chronology Program; as assistant editor of "Notes and News in the Plains Area," for *American Antiquity;* and as associate editor for the *Plains Anthropologist.* At the 18th Plains Conference, held in Norman, Okla., on Thanksgiving weekend, he served as chairman of the session on "Field Reports" and as a panel discussant for the session on "The Aksarben Aspect."

Dr. Stephenson presented a paper, "The Housing Problem," at the seventy-first annual meeting of the Nebraska Academy of Sciences in Lincoln on April 14. During the year he wrote a number of book reviews for various scientific journals. He also wrote a brief article, "Comments on 'Relationships between the Caddoan Area and the Plains' by Robert E. Bell," for publication in the *Bulletin* of the Texas Archeological Society. On May 7 he was the guest speaker at the annual meeting of the Iowa Archeological Society, talking on the subject, "Drowning Our Heritage." Throughout the year he gave seven other talks on various aspects of Missouri Basin Salvage Archeology before regular meetings of local civic organizations and school groups. In July he drove to Moscow, Idaho, to deliver a load of archeological specimens from the Missouri Basin to Dr. Alfred Bowers of the University of Idaho and to consult with Dr. Bowers on the analysis of the material. While there he met with the executive dean of the University of Idaho to confer on problems involved in anthropological programs in the University. In May he was invited to Accokeek, Md., as a consultant to the Accokeek Foundation on an archeological research program for the Accokeek area. He took annual leave to serve as part-time assistant professor of anthropology on the faculty of the University of Nebraska during both the first and second semesters of the academic year. At the end of the year he was conducting investigations in prehistoric Indian village sites in the Oahe Reservoir area.

Dr. Warren W. Caldwell, archeologist, when not in charge of field parties, devoted most of his time to analyses of specimen materials he had recovered from salvage excavations in previous years. He completed final revisions of his manuscript "Archeological Investigations at the Hickey Brothers Site, 39LM4, Lyman County, South Dakota," in collaboration with Lee G. Madison and Bernard Golden; and of the manuscript "The Garrison Dam and Reservoir," in collaboration with G. Hubert Smith. He continued the detailed analysis of materials from the Black Partizan site (39LM218) in the Big Bend Reservoir, S. Dak., and in collaboration with Harry E. Weakly con-

tinued work on the dendrochronological materials from the Big Bend and Oahe Reservoirs of South Dakota. In May he consulted with Dr. Douglas Osborne of the National Park Service regarding complete revision and expansion of his monograph, "The Archeology of Wakemap; A Stratified Site near the Dalles of the Columbia," for publication in the National Park Service series. He also completed "Dendrochronology and the Missouri Basin Chronology Program," which was published in *The Tree Ring Bulletin*, vol. 23, No. 3. In addition, he wrote several book reviews. On July 30 he served as chairman of the 17½th Plains Conference in Pierre, S. Dak., and over Thanksgiving weekend he gave a report on his current fieldwork at the 18th Plains Conference in Norman, Okla. On April 14 he presented a paper at the seventy-first annual meeting of the Nebraska Academy of Sciences held in Lincoln, entitled "Some Thoughts on Guns and Indians." During the year he continued to serve as chairman of the dendrochronology section of the Missouri Basin Chronology Program; as assistant editor for reviews and literature for the *Plains Anthropologist*, and as Plains collaborator for the Society for American Archeology publication, *Abstracts of New World Archaeology*. On annual leave he continued to serve as part-time assistant professor of anthropology on the faculty of the University of Nebraska. At the end of the year he was again engaged in excavating archeological sites in the Big Bend Reservoir area.

Robert W. Neuman, archeologist, when not in the field conducting excavations, was analyzing archeological materials he had previously excavated in the Big Bend Reservoir area. He completed four manuscripts and had them accepted for publication: "The Olson Mound (39BF223) in Buffalo County, South Dakota"; "Salvage Archeology at a Site near Fort Thompson, South Dakota"; "A Bibliography of Archeological References Relating to the Central and Northern Great Plains Prior to 1930"; and "Domesticated Corn from a Fort Walton Mound in Houston County, Alabama." The first three will be published in the *Plains Anthropologist;* the fourth in the *Florida Anthropologist.* An article, "Indian Burial Mounds in the Upper Missouri River Basin," was published in *Progress* of the Interior Missouri Basin Field Committee. During the year he served as chairman of the carbon-14 section of the Missouri Basin Chronology Program. On Thanksgiving weekend he presented two papers at the 18th Plains Conference in Norman, Okla., entitled "Excavations at Four Mound Sites in the Oahe Reservoir" and "The Brother of All Document, 1888." During late April and early May he drove to Washington, D.C., and Knoxville, Tenn., to deliver a load of Missouri Basin archeological specimens and to confer with archeologists at both cities. At the end of the year he was again in the field conducting archeological excavations.

G. Hubert Smith, archeologist, after completing his fieldwork in August, was on duty the remainder of the year in the Lincoln office analyzing materials and preparing reports of work previously accomplished at historic sites in the Missouri Basin. His principal effort was directed toward preparation of a large monograph combining his own and several other investigators' work at the site of Fort Berthold and Like-a-Fishhook Village (32ML2) in the Garrison Reservoir, and by the end of the year he was well along on this manuscript. He also prepared an article, "Historical Archeology in the Missouri Basin Reservoir Areas," that was published in the *Plains Anthropologist* in November, and wrote (in collaboration with Warren W. Caldwell) a manuscript, "The Garrison Dam and Reservoir," for publication by the U.S. Army Corps of Engineers. Throughout the year he served as assistant editor for historic sites archeology for the *Plains Anthropologist* and as chairman of the historic documentation section of the Missouri Basin Chronology Program. He participated in the 18th Plains Conference, held in Norman, Okla., over Thanksgiving weekend with a report of his current field activities. On September 23–24 he participated as a discussant at the "Conference on Historic Buildings and Sites" at Iowa State University at Ames. On January 26–28, at the annual meeting of the Society of Architectural Historians, in Minneapolis, Minn., he presented an illustrated paper on "Frontier Buildings on the Upper Missouri," and on May 20 a similar paper, "Early Historic Buildings in the Missouri Basin," at the annual meeting of the Nebraska Association of Architects, held in Lincoln. On April 14 he spoke at the seventy-first annual meeting of the Nebraska Academy of Sciences in Lincoln on "Early Historic Sites and Buildings on the Upper Missouri: Some Problems of Evidence." At the close of the year he was at work in the Lincoln office on his monograph on site 32ML2.

TABLE 1.—*Specimens processed July 1, 1960—June 30, 1961*

Reservoir	Number of sites	Catalog numbers assigned	Number of specimens processed
Big Bend	6	496	2, 161
Fort Randall	1	83	1, 339
Walter F. George	57	2, 341	24, 101
Lewis and Clark	1	25	135
Oahe	15	2, 417	8, 145
Sites not in reservoirs	3	151	226
Site totals	83	5, 513	36, 107
Collections not assigned site numbers	1	3	46
Combined totals	84	5, 516	36, 153

As of June 30, 1961, the Missouri Basin Project had cataloged 1,255,716 specimens from 2,141 numbered sites and 59 collections not assigned site numbers.

Specimens restored: Two pottery vessels and one vessel section.
Specimens repaired: Fourteen nonpottery artifacts.
Specimens transferred to other agencies:
To the United States National Museum:
Archeological specimens from 425 sites in 10 reservoir areas.
Unworked shell from 16 sites in three reservoir areas.
To the University of Nebraska State Museum:
Identified, unworked animal bone from 120 sites in seven reservoir areas.

TABLE 2.—*Record material processed July 1, 1960–June 30, 1961*

MISSOURI BASIN PROJECT

Reflex copies of records	8,465
Photographic negatives made	1,507
Photographic prints made	8,916
Photographic prints mounted and filed	1,894
Transparencies mounted in glass	498
Kodachrome pictures taken in lab	160
Cartographic tracings and drawings	66
Artifacts sketched	45
Plates lettered	40
Profiles drawn	11
Plate layouts made for manuscripts	12

Cooperating institutions.—During the fiscal year a number of institutions cooperated in the Inter-Agency Salvage Program in several areas. In addition to those previously mentioned in the sections pertaining to Alabama-Georgia and the Missouri Basin, the following work was carried on under agreements with the National Park Service:

The University of Arkansas made studies in the Beaver Reservoir area on the White River and the Millwood Reservoir on Little River. The University of Kentucky conducted investigations in the Nolin Reservoir area on the Nolin River. The University of North Carolina worked at the Wilkesboro Reservoir on the Yadkin River. The University of Tennessee carried on activities in the Milton Hill Reservoir on the Clinch River. The Carnegie Museum of Pittsburgh studied archeological manifestations in the Shenango Reservoir area on the Shenango River. The New Jersey State Museum conducted investigations at Tocks Island. The University of Illinois had a project at the Shelbyville Reservoir on the Kaskaskia River, and Southern Illinois University made a series of excavations in the Carlyle Reservoir Basin on the same river. The Wisconsin State Historical Society conducted investigations in the Kickapoo Reservoir area on the Kickapoo River. The University of Texas carried on a series of surveys in the Texas Gulf Project. The Kansas State Historical

Society excavated in the Council Grove Reservoir on the Grand (Neosho) River. The University of Arizona continued its investigations in the Painted Rock area on the Gila River. The Museum of Northern Arizona continued its studies in the Glen Canyon Reservoir area on the Colorado River, as did the University of Utah in the same area and in the Flaming Gorge and Plainfield Reservoir Basins. The Museum of New Mexico worked in the Navajo Reservoir area along the San Juan River. The College of the Sequoias conducted investigations in the Terminus Reservoir area on the Kaweah River in California. Idaho State College worked in the Bruce's Eddy area on the North Fork of the Clearwater River. Washington State College continued its excavations in the Lower Monumental and Ice Harbor areas along the Columbia River and the University of Washington worked on the Priest Rapids-Wanapum Project in the Middle Columbia River district. The University of Oregon investigated sites in the John Day Reservoir Basin on the John Day River. Several institutions volunteered to carry on survey work without an agreement with the National Park Service. They include groups in Pennsylvania, New York State, Ohio, Indiana, southern California, and West Virginia. In the latter State the West Virginia Geological Survey did reconnaissance work in the Summerville Reservoir area on the Gauley River.

ARCHIVES

The Bureau archives continued under the custody of Mrs. Margaret C. Blaker, archivist. In May 1961 Mrs. Blaker visited the Haverford College Library, Haverford, Pa., where she examined pictorial and manuscript material in the Quaker Collection concerning American Indians, and in June, visited the library of Hampton Institute, Hampton, Va., and examined an extensive collection of field and studio photographs relating to Indians who were students at Hampton in the period 1880–1900. On July 10, 1960, Mrs. Caroline R. Cohen was appointed as junior anthropologist and was assigned to assist in the archives.

MANUSCRIPT COLLECTIONS

The 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, were transmitted to the Bureau archives by Dr. Olbrechts' widow, Mrs. Margriet Olbrechts of Wezembeek-Oppem, Belgium, through Dr. A. E. Meeussen, Koninklijk Museum, Tervuren, Belgium. Dr. Olbrechts died at Aix-la-Chapelle, March 24, 1958. The subject matter of the papers consists of the following categories: Vocabularies, grammar, texts, disease-name papers, Wilnoti formula papers, botany, myths, and miscellaneous ethnographic notes.

An 18-page inventory has been prepared, and the papers, which occupy 28 boxes, are available for study and microfilming.

The manuscript collection continued to be utilized by anthropologists and other students. About 300 manuscripts were consulted by searchers who visited the archives in person or purchased microfilm and other reproductions totaling 7,146 pages. An equal number of manuscripts was consulted by the archivist in obtaining information for over 90 mail inquiries. In the course of this examination, new and more detailed descriptions of manuscripts were also prepared for the permanent catalog and for future distribution in response to specific inquiries.

PHOTOGRAPHIC COLLECTIONS

The Bureau's collection of North American Indian photographs, which is one of the most extensive and most active of its kind, continued to grow through the generosity of interested individuals who either lent pictures for copying, or presented them as gifts.

Sixty original photographs of Mesquakie Indians, mainly taken by J. L. Hudson of Tama, Iowa, and apparently dating in part from the 1860's, were lent for copying by Norman Feder of New York City. Mr. Feder also lent a series of about 40 copy prints of Prairie Pottawotomie of the latter part of the 19th century.

Over 150 photographic slides of American Indian subjects were received on loan from Mrs. Doris Collester of East Riverdale, Md. Of especial interest are several dozen slides of Apache, Pima, and Maricopa Indians dated 1871 or in years of the following decade. Many of the slides bear the name of Moore, Bond & Co., Chicago or Moore, Hubbell, & Co., Chicago, as distributor, although the original source of most of the photographs is still unknown.

Forty-six photographs relating to Cree and Chipewyan Indians in Alberta, Saskatchewan, and Mackenzie, Canada, taken by Dr. Francis Harper on an expedition of the Geological Survey of Canada to the Great Slave Lake in 1914 were obtained from the Geological Survey of Canada, through the courtesy of Dr. Francis Harper and Dr. J. M. Harrison, Director of the Survey.

A scrapbook of James Earl Taylor, artist-correspondent for *Frank Leslie's Illustrated Weekly Newspaper* from 1863 to 1883, was received as a gift from the Pennsylvania Historical and Museum Commission, through John Witthoft. The scrapbook contains several hundred original photographic prints of western Indians, several photographs of Army officers, linecuts of western military posts, and other material assembled for the artist's reference, as well as reproductions of a number of Taylor's own illustrations.

Seventeen photographs of important men of the Osage, Caddo, Arapaho, Cherokee, Creek, Chickasaw, and Seminole tribes were

borrowed for copying from the Quaker Collection, Haverford College Library, Haverford, Pa., through the courtesy of Dr. Thomas E. Drake. The portraits are all on similar mounts of the carte de visite style, and most are inscribed with the subjects' names and the dateline September 1865, Fort Smith, Ark. Only one of the photographs has a photographer's imprint. It is a portrait of Left Hand and Powder Face, Arapahoes, with Superintendent Enoch Hoag. On the reverse is stamped, "W. H. Lamon, Photograph Artist, Corner Massachusetts & Henry Sts., Lawrence, Kansas." Four views of Kickapoo bark- and mat-covered lodges in Chief Wapamashawa's village, Indian Territory, were also borrowed from the Quaker collection and copied.

Thirteen photographs, including 10 relating to Kiowa, Wichita, and Apache Indians, by Irwin of Chickasha, Indian Territory, 1892–ca. 1894, were lent for copying by Vernon M. Riley of Chino, Calif.

Five photographs relating to Omaha and Ponca Indians of the latter 19th century, and a group photograph of the officers of the American Association for the Advancement of Science at Ann Arbor, 1885, including the Reverend J. Owen Dorsey and Mrs. Erminnie A. Smith (both formerly associated with this Bureau) were lent for copying by Mrs. Virginia Dorsey Lightfoot of Takoma Park, Md.

Five photographs of Osage Indians, taken in 1871 by T. M. Concannon at the Osage Agency, Indian Territory, were received as a gift from Mrs. Ernest J. Martin of Drain, Oreg.

Nine photographs relating to Indians of the Southwest who were connected with projects of the U.S. Bureau of Reclamation in that area in 1941–60 were donated by the Bureau of Reclamation.

Ten copy photographs of Ute Indians of the 1870's and 1880's were received in exchange from Dr. Omer C. Stewart of Boulder, Colo.

Six recent photographs of Quapaw Indians of Oklahoma were presented by Mrs. Velma Nieberding of Miami, Okla.

A collection of between 100 and 200 mounted photographs and glass slides was received as a transfer from the library of the United States Department of the Interior. At year's end these photographs had not yet been arranged and individually listed. They relate to a variety of North American Indian tribes.

During the year prints were prepared from several hundred snapshot negatives by Matilda Coxe Stevenson that had not been previously cataloged. Most of the photographs were made at Zuñi Pueblo, ca. 1904. They include numerous views relating to dances and ceremonials and a lesser number pertaining to domestic activities. In spite of the fact that some of the photographs are not of high quality photographically, many are surprisingly clear and informative, and the collection as a whole warrants careful study.

In addition to the Zuñi views, in the Stevenson collections there are a relatively small number of photographs relating to the pueblos

of Cochití, ca. 1904, San Ildefonso, ca. 1908, and Santa Clara, ca. 1911. A 16-page caption list of the entire collection has been prepared.

The photographic files continued to be used extensively by scholars and the general public. The year's total of approximately 600 purchase orders and written and personal inquiries concerning photographs is about equal to that of last year, while the total of over 2,000 prints distributed exceeds last year's figure.

ILLUSTRATIONS

Work during the past fiscal year consisted of the preparation of numerous charts, graphs, diagrams, and maps, the restoration of photographs, photo retouching, and the drawing of a variety of Indian artifacts. Also many miscellaneous drawings, diagrams, etc., were prepared for other branches of the Institution.

LIBRARY

Detailed information about the Bureau library is contained in the report of the librarian on the Smithsonian Library, but it is well to emphasize the fact that the Bureau library is still serving a useful purpose in providing reference material not only for members of the staff but for students and professionals in the Washington area and visitors from other parts of the country. However, it should be pointed out that the library is not wholly fulfilling the function that it should because of the lack of a librarian. A full-time librarian would not only greatly expedite the use of the facility by members of the staff, but would also be extremely helpful to those who find it necessary to consult publications in the Bureau library, many of which are not available in many other places. Furthermore, through an intimate knowledge of the material now available, a librarian would be able to see that new publications pertaining to the Bureau's researches are acquired promptly when they become available. For many years the Bureau library was one of the outstanding places in North America for anthropological research, and it well merits a return to its former status.

EDITORIAL WORK AND PUBLICATIONS

The Bureau's editorial work continued during the year under the immediate direction of Mrs. Eloise B. Edelen. There were issued one Annual Report and two Bulletins, as follows:

Seventy-seventh Annual Report of the Bureau of American Ethnology, 1959–60. ii+35 pp., 2 pls. 1961.

Bulletin 176. River Basin Surveys Papers, Nos. 15–20, Frank H. H. Roberts, Jr., editor. ix+337 pp., 65 pls., 25 figs. 1960.

No. 15. Historic sites archeology on the Upper Missouri, by Merrill J. Mattes.

Bulletin 176—Continued

No. 16. Historic sites archeology in the Fort Randall Reservoir, South Dakota, by John E. Mills.

No. 17. The excavation and investigation of Fort Lookout Trading Post II (39LM57) in the Fort Randall Reservoir, South Dakota, by Carl F. Miller.

No. 18. Fort Pierre II (39ST217), a historic trading post in the Oahe Dam area, South Dakota, by G. Hubert Smith.

No. 19. Archeological investigations at the site of Fort Stevenson (32ML1), Garrison Reservoir, North Dakota, by G. Hubert Smith. With an introduction by Robert L. Stephenson and an appendix by Carlyle S. Smith.

No. 20. The archeology of a small trading post (32MN1) in the Garrison Reservoir (Kipp's Post) South Dakota, by Alan R. Woolworth and W. Raymond Wood.

Bulletin 180. Symposium on Cherokee and Iroquois culture, edited by William N. Fenton and John Gulick. VI+292 pp. 1961.

No. 1. Foreword by the editors.

No. 2. Iroquois-Cherokee linguistic relations, by Floyd G. Lounsbury.

No. 3. Comment on Floyd G. Lounsbury's "Iroquois-Cherokee Linguistic Relations," by Mary R. Haas.

No. 4. Iroquois archeology and settlement patterns, by William A. Ritchie.

No. 5. First comment on Wlliam A. Ritchie's "Iroquois Archeology and Settlement Patterns," by William H. Sears.

No. 6. Second comment on William A. Ritchie's "Iroquois Archeology and Settlement Patterns," by Douglas S. Byers.

No. 7. Cherokee archeology, by Joffre L. Coe.

No. 8. Comment on Joffre L. Coe's "Cherokee Archeology," by Charles H. Fairbanks.

No. 9. Eastern Woodlands community typology and acculturation, by John Witthoft.

No. 10. Comment on John Witthoft's "Eastern Woodlands Community Typology and Acculturation," by John M. Goggin.

No. 11. Cherokee economic cooperatives: the Gadugi, by Raymond D. Fogelson and Paul Kutsche.

No. 12. The rise of the Cherokee state as an instance in a class: The "Mesopotamian" career to statehood, by Fred O. Gearing.

No. 13. Comment on Fred O. Gearing's "The Rise of the Cherokee State as an Instance in a Class: The 'Mesopotamian' Career to Statehood," by Annemarie Shimony.

No. 14. Cultural composition of the Handsome Lake religion, by Anthony F. C. Wallace.

No. 15. Comment on Anthony F. C. Wallace's "Cultural Composition of the Handsome Lake Religion," by Wallace L. Chafe.

No. 16. The Redbird Smith movement, by Robert K. Thomas.

No. 17. Comment on Robert K. Thomas's "The Redbird Smith Movement," by Fred W. Voget.

No. 18. Effects of environment on Cherokee-Iroquois ceremonialism, music, and dance, by Gertrude P. Kurath.

No. 19. Comment on Gertrude P. Kurath's "Effects of Environment on Cherokee-Iroquois Ceremonialism, Music, and Dance," by William C. Sturtevant.

No. 20. The Iroquois fortunetellers and their conservative influence, by Annemarie Shimony.

No. 21. Change, persistence, and accommodation in Cherokee medico-magical beliefs, by Raymond D. Fogelson.

No. 22. Some observations on the persistence of aboriginal Cherokee personality traits, by Charles H. Holzinger.

No. 23. First comment on Charles H. Holzinger's "Some Observations on the Persistence of Aboriginal Cherokee Personality Traits," by David Landy.

No. 24. Second comment on Charles H. Holzinger's "Some Observations on the Persistence of Aboriginal Cherokee Personality Traits," by John Gulick.

No. 25. Iroquoian culture history: A general evaluation, by William N. Fenton.

Publications distributed totaled 29,845, as compared with 31,547 for the fiscal year 1960.

COLLECTIONS

The following collections were made by staff members of the Bureau of American Ethnology or of the River Basin Surveys and transferred to the permanent collections of the department of science and technology, the department of civil history, and the department of anthropology, U.S. National Museum:

FROM BUREAU OF AMERICAN ETHNOLOGY

Acc. No.

236067. Dictaphone. Through Dr. Frank H. H. Roberts, Jr.

234469. 31 Belgian postage stamps. Through Mrs. Margaret C. Blaker.

FROM RIVER BASIN SURVEYS

225806. 160 land and fresh-water mollusks from Arkansas and South Dakota. Through Dr. Robert L. Stephenson.

232081. Indian skeletal remains from Big Bend Reservoir, Buffalo County, S. Dak.

232741. 5,153 archeological items and skeletal material from Fall River County, S. Dak., and Crook and Fremont Counties, Wyo., 1957.

233812. Indian skeletal materials from the McNary Reservoir region.

MISCELLANEOUS

Dr. M. W. Stirling, Dr. John P. Harrington, Dr. A. J. Waring, and Sister Inez Hilger continued as research associates. Dr. Stirling, assisted by Mrs. Marion Stirling, using the Bureau's laboratory facilities, completed work on the materials from the Ecuadorian field trip undertaken while he was Director of the Bureau, and turned in a manuscript which will be published in the Bureau's series of anthropological papers.

The following bibliographies and leaflets were issued during the fiscal year:

SIL–50, 3d rev., 2/61: Selected list of portraits of prominent Indians in the collections of the Bureau of American Ethnology.

SIL–53, rev., 2/61: Photographic collections of the Bureau of American Ethnology.

SIL–76, rev., 7/60: Statement regarding the Book of Mormon.

SIL–92, rev., 1/61: Origin of the American Indian.

SIL–134, rev., 10/60: American Indian languages.
SIL–175, rev., 3/61: Selected references on present-day conditions among U.S. Indians.
SIL–264, 11/60: Selected references on the Indian and the Frontier.
SIL–276, 1/61: Linguistic considerations in the interpretation of place names.

Other bibliographies were revised during the year. They are: the "Battle of the Little Bighorn" (should be available for distribution by September 1961), and the popular "Bibliography of American Indian Medicine" (available before December 1961.)

The nearly 3,900 letters received in the Director's office plus a few hundred received by staff members are a good indication of the continued interest in the American Indian. In addition, several thousand letters requesting Bureau publications are received yearly in the Editorial and Publications Division. Many complete sets of the Bureau's bibliographies were sent out upon requests from college and university professors and libraries, and to other educational organizations. Approximately 10,200 informational items, including typescript and printed articles, bibliographies, and other leaflets, plus more than 300 photographic lists were mailed from the main Bureau office in response to requests for such materials. Many specimens were mailed in or brought to the office for identification and data on them were supplied.

Respectfully submitted.

FRANK H. H. ROBERTS, JR., *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, 1961:

The Astrophysical Observatory includes two divisions: the Division of Astrophysical Research in Cambridge, 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. The field station at Table Mountain, Calif., carries out solar observations. 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

The Observatory research staff made significant contributions to knowledge of solar astrophysics, meteors, meteorites, artificial satellites, geophysics, and space science. The continuing refinement of observational techniques and the development of new analytical methods provided valuable data and opened up new areas of astrophysical investigation.

The Observatory continued, with mutual benefit, its close liaison with Harvard College Observatory, the Massachusetts Institute of Technology, Boston University, and other research centers.

Solar astrophysics.—Dr. Paul W. Hodge studied the properties of the field stars and globular clusters in the Large Magellanic Cloud and found that they apparently differ from our galaxy in color, magnitudes, luminosity, and evolutionary pattern. These findings are important in establishing the true extragalactic distance scale.

Stephen E. Strom completed his study of absorption below 100 A. to determine the optical depth of the interstellar medium as a function of wavelength in the X-ray region. He found that the region above 40 A. is essentially "black" (in terms of presently conceived fluxes) and that, owing to the K-absorption limit of oxygen, there is

an interesting "jump" at 23.3 A. in the curve of optical depth versus wavelength.

Dr. Charles A. Whitney continued his research in stellar atmospheres. From computations based on novel analytical methods, carried out by Angelo J. Skalafuris, he has formulated a simplified analytical description of the cooling rate behind shock waves. This work corrects the erroneous results of an earlier investigator, and also serves to check the range of validity of assumptions of "optically thin" perturbations (i.e., neglect of reabsorption of shock radiation). In his investigation of the gas dynamics of stellar atmospheres, also assisted by Mr. Skalafuris, he is concentrating initially on the structure of shock fronts in pure hydrogen, and in successive stages will work toward a unified theory incorporating the effects of radiation and the wide departures from thermodynamic equilibrium. Dr. Whitney's continuing project on the cause and nature of stellar pulsation has closely approached a definitive statement of the cause of pulsation aided by the success of Dr. John P. Cox, who served as consultant, in obtaining exact solutions for the nonadiabatic linearized wave equation. Miss Sylvia Boyd began compilation of spectrographic and photometric data on pulsating stars, which will undergo analysis in the light of the Cox-Whitney theory; Dr. R. G. Teske's investigation, under Dr. Whitney's supervision, of spectrum-line formation in pulsating stellar atmospheres indicates the need for revision of earlier interpretations.

To provide a foundation for the analysis of astrophysical data expected from future orbiting observatories, Dr. Whitney began preliminary work on methods of constructing accurate model stellar atmospheres. Using electronic computations provided by SAO, he is extending and modifying recent theoretical developments, including the work of Dr. Max Krook and his students. Owen Gingerich's completed computer program for the construction of accurate model atmospheres in radiative equilibrium has demonstrated the inadequacy of much earlier work in solar radiation and its implications for the model of the sun's atmosphere. Shiv Kumar has virtually completed the construction of several models for the atmosphere of very hot stars.

Dr. Richard McCrosky, with the use of infrared-sensitive detectors on the 61-inch telescope of the Harvard College Observatory, continues his observations of Raman-scattered Lyman α to determine the presence of hydrogen molecules in interstellar space.

Dr. Max Krook is proceeding with his theoretical research into the further development and application of methods for determining the structure of nongray atmospheres. In collaboration with Dr. Whitney, he is now calculating a number of model atmospheres. He is also applying the methods developed in continuum theories in gas

dynamics to problems of the flow of rarefied gases, various problems in the dynamics of ionized gases, and the exact solution of one-dimensional problems in the kinetic theory of gases.

Fred A. Franklin made progress in his dynamical and photometric studies of the rings of Saturn and of the interaction between the rings and particles of the solar corpuscular stream. The results should apply to other astronomical problems and should yield precise values of the solar corpuscular flux.

At the Table Mountain station, Dr. Alfred G. Froiland, employing the atmospheric coefficients obtained by Smithsonian work, devised a method for determining the ozone in the vertical path.

Meteoritical studies.—The Director and Dr. Luigi G. Jacchia completed their analysis and discusssion of the orbits of 413 accurately reduced meteors. Dr. Jacchia will continue his study of the reduced material.

The Director has been investigating the distribution of semimajor axes among comet orbits and has derived the following law for the frequency distribution of lifetimes of long-period comets: Potential lifetimes of new comets are distributed according to the negative three-halves power of the lifetime in number of revolutions. His theories on the structure of the cometary nucleus will form a chapter in a forthcoming book on the solar system. From rocket, satellite, and space-probe data the Director completed a study of the influx of micrometeoritic dust on earth. The work adds significantly to knowledge of the structure and evolution of the solar system and has practical importance for the engineering and operation of space vehicles.

Robert E. Briggs is continuing his study of the distribution of interplanetary dust particles in space. This work should provide valuable data for current and future research on the nature of interplanetary space and the origin and properties of the dust particles.

Dr. John A. Wood has been conducting a study of variations in chemical composition between individual chondrules extracted from a chondrite (Bjurböle). He is analyzing these small chondrules with a direct-current arc emission spectrograph. He has also been making a theoretical analysis of the diffusion of nickel in the nickel-iron phases of iron meteorites, to determine cooling rates and thermal histories which could account for the curious nonequilibrium nickel concentration profiles noted by Uhlig and others in irons. His brief analysis and description of the new meteorite Ras Tanura (Saudi Arabia) is being prepared for publication.

Dr. E. L. Fireman, Dr. David Tilles, and James DeFelice measured the radioactive isotopes tritium and argon-37 in recovered satellite material. The tritium content of some material from the Discoverer XVII satellite was unusually high but decreased rapidly with increasing depth. Discoverer XVII was exposed to an intense

solar flare (3+ magnitude). The high tritium content and its depth dependence in the satellite material lead to the conclusion that the solar flare contains 0.4 percent tritium. This is the first measurement of a radioactive isotope from the sun.

Dr. Fireman completed measurements of argon-37, argon-39, and tritium in several freshly fallen meteorites, and showed that the cosmic-ray flux is higher at a distance of one astronomical unit from the earth than at three. He has also obtained preliminary measurements on radioactive isotopes in the Bruderheim meteorite. His analysis of uranium, potassium, argon-140, and krypton-xenon in iron meteorites will help determine the age and early history of the meteorites.

Dr. Paul W. Hodge continues his study of the rate of accretion by the earth of meteoritic matter and will determine especially the physical and chemical properties of fine dust particles collected by jet aircraft at altitudes varying from 30,000 to 90,000 feet. Collections at even greater heights, up to 250,000 feet, will be attempted.

Dr. Richard E. McCrosky, with the collaboration of the Harvard College Observatory, U.S. Air Force, Lincoln Laboratories, and National Aeronautics and Space Administration, continues his attempt to reproduce the meteor phenomena by a study of artificial meteors. The results should help calibrate the mass-luminosity scale of natural meteors. From a project designed to recover a larger number of meteorites as soon as possible after their fall, Dr. McCrosky will seek data on the cosmic-ray intensity in the vicinity of the earth and throughout the orbit of the meteorite. His findings will add to our present inadequate knowledge of the numbers, masses, and orbits of meteorites.

Dr. McCrosky continued his planning of a program to locate and recover meteorites as soon as possible after their fall, by photographing meteors in flight and analyzing the photographic records to find the place of fall. The program will also augment our knowledge of the number, masses, and orbits of large meteors. Preliminary design of the stations is complete; the general location of the stations in the network in the Midwest has been determined; and a machine program for computation of impact points has been completed. The program has not yet received financial support. In view of the scientific results that can be expected from this project, it should be funded as soon as possible.

Dr. F. Behn Riggs, Jr., designed and developed an electron probe microanalyzer to make possible a point-by-point chemical analysis of polished surfaces of sectioned meteorites without destruction of samples. Analyses of micrometeorites, along with other experiments in bringing the electron beam into the air, have resulted in a useful evaluation of unsolved technical problems.

Pedro E. Zadunaisky has begun an analysis of the motion of Halley's Comet in order to check current theories about the forces perturbing the elliptic motion of a comet.

Opening a new field for study, Dr. Tilles will construct a high-sensitivity mass spectrometer and from recovered satellite samples will measure the isotopic composition of the gases in solar winds and flares. He will also study the stable isotopes of noble gases in meteorites and terrestrial rocks.

Satellite-tracking program.—The optical tracking of artificial satellites with NASA support continues to provide data for the prediction of orbits and for basic research in the space sciences. The program comprises a worldwide organization of Moonwatch teams, the operation of 12 precision photographic stations in various parts of the world, the calculation of satellite ephemerides, photographic image reduction, detailed analysis by electronic computers, and precise reduction of satellite positions.

From May 1, 1960, to May 1, 1961, Moonwatch observations of 57 satellites and their orbiting components provided data for correcting ephemerides and for acquiring and reacquiring satellites. The stations also conducted a number of searches for orbiting objects.

Dr. Gustav A. Bakos's analysis of Moonwatch observations indicates that they compare favorably with those made by radar and with field reduced observations by SPOT.

Major developments in operational techniques of the Baker-Nunn camera stations were accomplished in two fields—the automation of matched-track and off-culmination observing methods, and the design and development of auxiliary equipment that enables the entire network to be synchronized to within a few milliseconds of time. These developments will prove extremely valuable in the forthcoming research in geodesy using direct triangulation methods.

Specifications were drawn for a new electronic time standard for the stations that would be capable of maintaining uniform and precise time to an accuracy of one-half millisecond. This clock, which will greatly improve observational accuracy, is unique in its field.

Five stations in the Baker-Nunn network worked in conjunction with the Jodrell Bank Radio Telescope in making optical observations of flare stars.

Of 13,556 films received from the Baker-Nunn camera stations, the photoreduction center completed reductions of 8,961. From July 1960 through April 1961 the computations center sent 32,592 predictions to the 12 Baker-Nunn camera stations, 11,160 transits of satellites were observed, and 14,361 reduced positions were reported.

The communications center cleared more than a million words per month, 95 percent of which represent satellite data received or sent throughout the world.

The research and analysis division has made valuable contributions to our basic knowledge of the earth and the upper atmosphere, described in detail under *Space Science.* In summary, the division has achieved greater accuracy in the analysis of the earth's gravitational potential field, established the gravitational ellipticity around the earth's equator, and determined the geodetic positions of the observing stations with greater exactness. The division has measured variations of atmospheric density in relation to solar activity and interplanetary storms, and studied the effect of solar light pressure on satellites.

Dr. Karoly Lassovszky is continuing his astrometric study of satellite positions determined from Baker-Nunn films. From approximately 800 measurements on 34 images of different length he analyzed the frequency distribution of settings, the relationship between this distribution and the length of the image, and the relationship between the "magnitude error" and the length of image. Position determinations have been made using reference stars at different distances. On the basis of these results, we can conclude that the accuracy is influenced neither by the distortion of the emulsion nor by the optical distortion within an area of a diameter of 5 cm. (5°.8). The standard error of a position determined from numerous measurements made with Mann comparators on Baker-Nunn films is ±1″.1, both in right ascension and in declination. The project should help evaluate the techniques of analysis and measurement now used for the precise reduction of satellite data. Dr. Lassovszky will also investigate the rapid and secular variations in brightness of satellites.

At the Florence meeting of COSPAR, April 10–14, 1961, the Director and Dr. George Veis presented a paper on the Observatory's "Experience in Precision Optical Tracking of Satellites for Geodesy." The Baker-Nunn cameras can photograph satellites to an accuracy of about ±2″ (seconds of arc) in topocentric position and ±1 millisecond in time. The locations of the cameras have been connected, with standard geodetic techniques, to the major geodetic systems and to a tentative uniform one. From an analysis of the observations, geodetic information of dynamic character has been obtained; i.e., the coefficients of the second, third, fourth, and fifth order zonal harmonics of the earth's gravity field as well as the coefficients of the second order sectorial harmonic. The launching of a well-planned and controlled flashing-light geodetic satellite for international use would reduce markedly the complexity and expense of observing stations and promote international geodesy in a remarkable fashion.

Space science.—Imre G. Izsak, in the first attempt to derive two important geophysical constants from the motion of satellites, has made a good estimate of the ellipticity of the earth's equator. He has also obtained a second-order solution of Vinti's dynamical problem.

In his study of satellite orbits with very small eccentricities he has found that the orbit has two perigees and two apogees during each revolution. He is continuing his investigation of the harmonics of the earth's gravitational potential.

Dr. Don A. Lautman has undertaken a numerical integration program to provide precise ephemerides of artificial satellites. He will check general perturbation theories and attempt to obtain orbits of satellites not at present subject to general theory, as well as of those whose perturbations are too large or too complicated to be handled conveniently by general perturbation theories.

Dr. Yoshihide Kozai has shown that the effects of solar-radiation pressure must be considered in the derivation of geodetic constants from satellite data. He is continuing his studies of astronomical constants and of the geodetic uses of artifical satellites. By analysis of deviations of computed orbits from those observed by Baker-Nunn cameras, he is attempting to determine the tesseral harmonics of the earth's gravitational potential and to obtain accurate coordinates of the camera stations. He will employ recently determined values from the motion of satellites to examine the relations between astronomical constants and to eliminate inconsistencies. Dr. Kozai's determinations from satellites of the spherical harmonics to the fifth order of the earth's gravitational field are generally accepted as the most precise available.

Pedro E. Zadunaisky, from a preliminary study of atmospheric drag on nonspherical satellites, has attempted to find a "mean" attitude of satellites in relation to their velocity vectors. He will continue with more refined techniques and a different group of satellites at higher altitudes. His analysis will contribute to our knowledge of atmospheric densities and of the motion of satellites around their center of gravity. His special study of the perturbations on the orbit of Echo I caused by atmospheric drag and solar-radiation pressure gave good agreement between theory and observation.

Dr. Gustav A. Bakos is progressing with his analysis of the seasonal changes of the earth's albedo. The project has significance for our understanding of the relationship which he has demonstrated between large-scale meteorological phenomena and the observed reflectivity of the earth.

Stephen E. Strom has developed the computer program and preliminary ray-tracing method for the study of the effect of the ionosphere on radio-astronomical observations.

Dr. Mario D. Grossi, with these computations and tracings as tools, will investigate the effect of the ionosphere, the Van Allen belts, and the earth's magnetic field on radio-astronomical observations in the MF and HF bands.

Dr. Luigi G. Jacchia's studies of atmospheric drag on artificial satellites have already contributed profoundly to our knowledge of atmospheric densities above the height of 200 km. His conclusions as to variations of the atmosphere with time, solar activity, and geographic position, as well as his determinations of the atmospheric density profile, have received general international acceptance. He will continue to explore the problems of solar-terrestrial effects.

Dr. G. Colombo has made a study of the motion of Explorer IV (Satellite 1958 Epsilon) around its center of mass, as inferred from observations of several kinds, and the possible causes of the strong variations of the elements of the tangential precessional motion. Although a precise knowledge of the residual magnetization of the body of the satellite and the ferromagnetic components of the payload is needed for an exact computation, he draws attention to the unexpected pronounced effect of the interaction between the earth's magnetic field and the shell (of stainless steel) of the satellite.

Dr. Leo Goldberg, with Dr. William Liller, is directing the design and construction of two ultraviolet scanning spectrometers for flight in the S–17 Satellite within the framework of the program of Orbiting Solar Observatories of the National Aeronautics and Space Administration. The combined spectral range of the spectrometers will be 75 A. to 1500 A. and the resolving power will vary between 0.3 A. at the longer wavelengths and 1.0 A. at the shortest wavelengths. Design of the spectrometers is now in the final stages. Calibration and testing of the instrument packages will be carried out in a new laboratory recently installed in the Space Science Building.

The work of the laboratory will also be expanded in the fall to include a broad program of basic research on the vacuum ultraviolet radiation of atoms and molecules of astrophysical importance with one- and two-meter vacuum spectrographs and a shock tube and flash tube as sources. The scanning spectrometers are scheduled for rocket flights at the end of 1961 and for flight aboard the S–17 Satellite during the last quarter of 1962.

Dr. Goldberg has been engaged in a study and survey of astronomical experiments that may be performed with satellite vehicles. The conclusions of the survey have been published in two chapters of "Science in Space" in collaboration with Dr. E. R. Dyer, Jr.

The Director and Dr. Robert J. Davis, astrophysicist in charge, together with other Observatory scientists, have progressed with the planning and development of the "Celescope" project, a group of astronomical telescopes to be carried in sounding rockets and later orbited in artificial earth satellites. Specifications for the satellite payload (telescope system) have been prepared, and final negotiation for the manufacture of the instruments is being awaited. With the aid of television images in three colors and slitless spectrograms of the

entire celestial sphere, these instruments will provide a means of extending astronomical observations to the far ultraviolet and X-ray regions of the spectrum.

The immediate objective of the project is to map about 100,000 stars and record their brightnesses. Further analysis in special detail of objects discovered by this survey is planned.

The first rocket flight carrying a prototype Celescope of simplified design should confirm our theoretical analyses and test some of the more critical elements of the Celescope's electronic system. Experiments have been delayed by rocket failure but should resume in February 1962.

The payload for the satellite will consist of imaging television-type detectors sensitive to certain ultraviolet spectra. These video images will be scanned and converted from analog to digital form prior to signal transmission to ground stations to preserve all the important stellar information. Models of this digital equipment have been designed and built in Celescope laboratories and will serve as guides for manufacturers building the satellite payload. The first telescope should go into orbit in 1963–64. The Celescope program is supported by NASA.

PUBLICATIONS

Publications of the Smithsonian Contributions to Astrophysics included numbers 2 through 4 of volume 4 and numbers 4 through 8 of volume 5.

The following papers by staff members of the Astrophysical Observatory appeared in various journals:

Aller, L. H. *See* Goldberg, Muller, and Aller.

Baez, A. V. A proposed X-ray telescope for the 1 to 100–A region. Journ. Geophys. Res. vol. 65, pp. 3019–3020, 1960.

Brown, J. *See* Goldberg, Mohler, and Brown.

Davis, R. J. U.S. plans for space telescopes for planets, stars, and nebulae. Mem. Soc. Roy. Sci. Liège, ser. 5, vol. 4, p. 25, 1961.

———. *See* also Strom, Strom, and Davis.

DeFelice, J. *See* Fireman and DeFelice; Fireman, DeFelice, and Tilles; Tilles, DeFelice, and Fireman.

Dyer, E. R., Jr. *See* Goldberg and Dyer.

Fireman, E. L. *See* Tilles, DeFelice, and Fireman.

Fireman, E. L., and DeFelice, J. Argon-37, argon-39, and tritium in meteorites and the spatial constancy of cosmic rays. Journ. Geophys. Res., vol. 65, pp. 3035–3041, 1960.

Fireman, E. L.; DeFelice, J.; and Tilles, D. Tritium in recovered satellite material (abstract). Bull. Amer. Phys. Soc., vol. 6, No. 3, p. 276, 1961.

Fireman, E. L., and Kistner, G. A. The nature of dust collected at high altitudes. Geochim. et Cosmochim. Acta, vol. 23, No. 5, 1961.

Gingerich, O. A computer program for non-grey stellar atmospheres. Mem. Soc. Roy. Liège, ser. 5, vol. 4, 1960.

Goldberg, L. Project West Ford—properties and analyses; Introduction. Astron. Journ., vol. 66, pp. 105–106, 1961.

———. Solar experiments. Astron. Journ., vol. 65, pp. 274–277, 1960.

———. Solar experiments—US. plans. Mem. Soc. Roy. Liège, ser. 5, vol. 4, pp. 30–38, 1961.

———. The sun. Science in Space (Space Science Board Rep.), 1960.

———. The sun. Bull. Atomic Scientists, vol. 17, pp. 210–213, 1961.

Goldberg, L., and Dyer, E. R., Jr. Galactic and extragalactic astronomy. Science in Space (Space Science Board Rep.), 1960.

———. The sun. Galactic and extragalactic astronomy. *In* Science in Space, edited by L. V. Berkner and H. Odishaw, chaps. 17, 18, 1961.

Goldberg, L.; Mohler, W. U.; and Brown, J. The measurement of the local doppler shift of the Fraunhofer lines. Astrophys. Journ., vol. 132, pp. 184–194, 1960.

Goldberg, L.; Muller, E. A.; and Aller, L. H. The abundance of the elements in the solar atmosphere. Astrophys. Journ., suppl. 5, No. 45, pp. 1–138, 1960.

Hagihara, Y. Gaps in the distribution of asteroids. Smithsonian Contr. Astrophys., vol. 5, No. 6, 1961.

———. On the motion of satellites with critical inclination. Smithsonian Contr. Astrophys., vol. 5, No. 5, 1961.

Hodge, P. W. NGC 2209: An unusual cluster of the large Magellanic cloud. Publ. Astron. Soc. Pacific, vol. 72, pp. 308–311, 1961.

———. Studies of the large Magellanic cloud: V. The young populous clusters. Astrophys. Journ., vol. 133, pp. 413–419, 1961.

Hodge, P. W., and Wright, F. W. The space density of atmospheric dust in the altitude range 50,000 to 90,000 feet. Tech. Rep., Air Force Cambridge Research Center (AFCRL 451), 1961.

Hodge, P. W.; Wright, F. W.; and Hoffleit, D. An annotated bibliography on interplanetary dust. Smithsonian Contr. Astrophys., vol. 5, No. 8, 1961.

Hoffleit, D. *See* Hodge, Wright, and Hoffleit.

Izsak, I. G. On satellite orbits with very small eccentricities. Astron. Journ., vol. 66, pp. 129–131, 1961.

———. Periodic drag perturbations of artificial satellites. Astron. Journ., vol. 65, pp. 355–357, 1960.

Jacchia, L. G. Artificial earth satellites. Scientia, ser. 6, vol. 54, 1960.

———. A variable atmospheric-density model from satellite accelerations. Journ. Geophys. Res., vol. 65, pp. 2275–2782, 1960.

Jacchia, L. G., and Whipple, F. L. Precision orbits of 413 photographic meteors. Smithsonian Contr. Astrophys., vol. 4, No. 4, 1961.

Kistner, G. A. *See* Fireman and Kistner.

Kozai, Y. Effect of precession and nutation on the orbital elements of a close earth satellite. Astron. Journ., vol. 65, pp. 621–623, 1960.

———. Note on the motion of a close earth satellite with a small eccentricity. Astron. Journ., vol. 66, pp. 132–134, 1961.

———. The gravitational field of the earth derived from motions of three satellites. Astron. Journ., vol. 66, pp. 8–10, 1961.

Kumar, S. S. On gravitational instability II. Publ. Astron. Soc., Japan, vol. 12, p. 290, 1960.

———. On gravitational instability III. Publ. Astron. Soc., Japan, vol. 13, p. 121, 1961.

McCrosky, R. E. Observations of simulated meteors. Smithsonian Contr. Astrophys., vol. 5, No. 4, 1961.

McCrosky, R. E., and Posen, A. Elements of photographic meteors. Smithsonian Contr. Astrophys., vol. 4, No. 2, 1961.

Mohler, W. U. *See* Goldberg, Mohler, and Brown.

Muller, E. A. *See* Goldberg, Muller, and Aller.

NODVIK, J. S. *See* Rustgi, Nodvik, and Weissler.
POSEN, A. *See* McCrosky and Posen.
RIGGS, F. B., JR. Vacuum sealing of gold wire leads to a differential thermopile. Rev. Sci. Instr., vol. 32, No. 3, p. 366, March 1961.
RUSTGI, O. P.; NODVIK, J. S.; and WEISSLER, G. L. Optical constants of germanium in the region 0–27 EV. Phys. Rev., vol. 122, p. 1131, 1961.
STROM, K. M. *See* Strom, S. E., and Strom, K. M.; Strom, Strom, and Davis.
STROM, S. E., and STROM, K. M. Interstellar absorption below 100 A. Publ. Astron. Soc. Pacific, vol. 73, pp. 43–45, 1961.
STROM, S. E.; STROM, K. M.; and DAVIS, R. J. A general method of analysis for n-lens, m-mirror systems (abstract). Journ. Opt. Soc. Amer., vol. 72, p. 43, 1961.
TILLES, D. *See* Fireman, DeFelice, and Tilles.
TILLES, D.; DEFELICE, J.; and FIREMAN, E. L. Argon-37 in recovered satellite material (abstract). Bull. Amer. Phys. Soc., ser. 2, vol. 2, No. 3, p. 277, 1961.
WEISSLER, G. L. *See* Rustgi, Nodvik, and Weissler.
WHIPPLE, F. L. The dust cloud about the earth. Nature, vol. 189, No. 4789, pp. 127–128, Jan. 14, 1961.
———. The earth's dust belt. Astronaut. Sci. Rev., vol. 3, No. 2, pp. 17–19, April–June 1961.
———. General conclusions. Mem. Soc. Roy. Sci. Liège, ser. 5, vol. 4, 1961.
———. Particulate contents of space. *In* Medical and Biological Aspects of the Energies of Space, P. Campbell, editor, 1961.
———. *See also* Jacchia and Whipple.
WRIGHT, F. W. *See* Hodge and Wright; Hodge, Wright, and Hoffleit.

The Special Reports of the Astrophysical Observatory distribute catalogues of satellite observations, orbital data, and preliminary results of data analysis prior to journal publication. Numbers 45 through 63, issued during the year, contain the following material:

Special Report No. 45, July 11, 1960.
List of coordinates of stations engaged in the observation of artificial earth-satellites, by D. V. Mechau.

Special Report No. 46, July 11, 1960.
The effect of a variable scale height on determinations of atmospheric density from satellite accelerations, by L. G. Jacchia.

Special Report No. 47 (C–15), Sept. 9, 1960.
Catalogue of satellite observations: Satellites 1958 Alpha, 1958 $\beta 1$, 1958 $\beta 2$, 1958 $\delta 2$, for Jan. 1–May 31, 1960, by D. V. Mechau.

Special Report No. 48 (C–16), Sept. 9, 1960.
Catalogue of satellite observations: Satellites 1959 $\alpha 1$ and 1959 $\alpha 2$ for Jan. 1–May 31, 1960, by D. V. Mechau.

Special Report No. 49 (C–17), Sept. 9, 1960.
Catalogue of satellite observations: Satellites 1959 Eta and $\iota 2$ for Jan. 1–May 31, 1960, by D. V. Mechau.

Special Report No. 50, Oct. 3, 1960.
The orbit of Satellite 1958 Alpha (Explorer I) during the first 10,500 revolutions, by P. E. Zadunaisky.

Special Report (unnumbered), Dec. 20, 1960.
Index to SAO Special Reports Nos. 1–50.

Special Report No. 51, Oct. 17, 1960.
Satellite orbital data: Satellites 1958 $\beta 1$ and 1958 $\beta 2$ by B. Miller; Satellites 1958 $\delta 2$ and 1959 $\nu 1$, by Y. Kozai, for Sept. 1959–April 1960, compiled by D. V. Mechau.

Special Report No. 52, Nov. 21, 1960.

A theory of satellite motion about an oblate planet: A second-order solution of Vinti's dynamical problem, by I. G. Izsak.

Special Report No. 53, Dec. 5, 1960.

The orbits and the accelerations of Satellites 1959 $\alpha 1$ and 1959 $\alpha 2$, by R. C. Nigam.

Special Report No. 54 (C–18), Dec. 19, 1960.

Catalogue of satellite observations: Satellites 1958 Alpha, 1958 $\beta 1$, 1959 $\beta 2$, 1958 $\delta 2$, 1958 Epsilon, for June 1–Aug. 31, 1960, by D. V. Mechau.

Special Report No. 55 (C–19), Dec. 19, 1960.

Catalogue of satellite observations: Satellites 1959 $\alpha 1$, 1959 $\alpha 2$, 1959 Eta, 1959 $\iota 1$, for June 1–Aug. 31, 1960, by D. V. Mechau.

Special Report No. 56, Jan. 30, 1961.

A method of analysis for lens and mirror systems, by R. J. Davis, S. E. Strom, and K. M. Strom.

A determination of the ellipticity of the earth's equator from the motion of two satellites, by I. G. Izsak.

Effects of solar radiation pressure on the motion of an artificial satellite, by Y. Kozai.

Special Report No. 57 (C–20), Mar. 3, 1961.

Catalogue of satellite observations: Satellites 1960 $\beta 1$ (carrier rocket Tiros I), for Apr. 1–June 1, 1960; 1960 $\beta 2$ (Tiros I), for Apr. 2–Aug. 31, 1960; 1960 $\gamma 1$ (carrier rocket, Transit I B), for Apr. 13–June 3, 1960; 1960 $\gamma 2$ (Transit I B) for Apr. 14–July 25, 1960, by D. V. Mechau.

Special Report No. 58 (C–21), Mar. 3, 1961.

Catalogue of satellite observations: Satellites 1960 $\iota 1$ (Echo I), and 1960 $\iota 2$ (carrier rocket, Echo I), for Aug. 12–Aug. 31, 1960, by D. V. Mechau.

Special Report No. 59, Mar. 3, 1961.

The positions of the Baker-Nunn camera stations, by G. Veis.

Special Report No. 60, Mar. 10, 1961.

The effect of radiation pressure on the secular acceleration of satellites, by S. P. Wyatt.

Special Report No. 61, Mar. 20, 1961.

Experimental and theoretical results on the orbit of Echo I, by P. E. Zadunaisky, I. J. Shapiro, and H. M. Jones.

Special Report No. 62, May 26, 1961.

The atmospheric drag of artificial satellites during the October 1960 and November 1960 events, by L. G. Jacchia.

Special Report No. 63, May 29, 1961.

Effect of the diurnal atmospheric bulge on satellite accelerations, by S. P. Wyatt.

OTHER ACTIVITIES

Members of the staff presented papers at meetings of the American Astronomical Society, the American Physical Society, the American Geophysical Union, the National Telemetering Conference, the American Meteorological Society, the American Astronautical Society, the American Philosophical Society, the Optical Society of America, the International Association of Geodesy, the Institute of Aeronautical Sciences, the National Aeronautics and Space Administration.

Dr. Fireman presented a paper at the International Atomic Energy Commission in Vienna and at a meeting of the Meteoritical Society in Los Angeles. The Director, Dr. Veis, Mr. Izsak, and Dr. Jacchia

attended a COSPAR meeting in Florence, Italy. Drs. Fireman, McCrosky, and Riggs held a meeting with the director of the American Meteorite Museum in New York. The Director and Mr. Izsak met with the Space Science Board in New York City. Mr. Izsak, with Dr. Kozai and Mr. Rolff, participated in the Space Age Geodesy Symposium at Columbus, Ohio.

Dr. Davis held consultations with scientists at the University of Wisconsin on the Orbiting Astronomical Observatory. Dr. Riggs attended the Pittsburgh Diffraction Conference and participated in an A.S.T.M. panel meeting on electron probe microanalysis. The Director, Dr. Veis, and Mr. Izsak attended the 12th assembly of the International Union of Geodesy and Geophysics in Helsinki in July. Dr. Hynek visited South Dakota in connection with unmanned balloon flights. Dr. Lautman, Dr. Kozai, and Mr. Nigman attended the Yale Summer Institute in New Haven. Drs. Whipple, Davis, Jacchia, and Whitney participated in the symposium on Aeronomy sponsored by the International Association of Geomagnetism and Aeronomy at Copenhagen in July.

Dr. Whitney attended the I.A.U. symposium in Varenna, Italy, August 1960, where he presented a paper prepared jointly with Dr. P. Ledoux on present-day knowledge of the gas dynamics of variable stars. Dr. Whitney also presented, at the International Meetings of Aeronomers in Copenhagen, July 1960, a survey of methods of deriving atmospheric densities from satellite accelerations.

The Director served as president of the Tenth Astrophysical Symposium on Far Ultraviolet Spectra of Astronomical Bodies at the University of Liège, Belgium. As president of the Subcommission 22a, the Director prepared and submitted a world-wide meteoritical report to Commission 22 of the International Astronomical Union. The objective, to further international research in the field of meteorites, was forwarded by literature in the area and contributions from other members of the Committee. The Director also acted as consultant to the Scientific Advisory Board of the U.S. Air Force during the year as well as to the Committee on Science and Astronautics of the House of Representatives.

STAFF CHANGES

The following scientists joined the staff: Dr. Leo Goldberg, solar astrophysics; Drs. Giuseppe Colombo, Yusuke Hagihara, and George Veis, research and analysis, satellite-tracking program; Drs. Richard B. Southworth, David Tilles, and John A. Wood, meteoritical studies; Dr. Om P. Rustgi, Celescope.

Dr. J. Allen Hynek resigned as associate director to become director of the Dearborn Observatory, Northwestern University.

Kenneth H. Drummond resigned as assistant director (management), to accept a similar position at the University of California,

La Jolla. Carlton W. Tillinghast, Jr., became the new assistant director.

As of June 30, 1961, 309 persons were employed at the Observatory.

BUILDINGS AND EQUIPMENT

In addition to two other leased buildings, the Astrophysical Observatory occupies the recently completed Harvard University Space Science Building on the grounds of the Harvard College Observatory. Dedication took place in December 1960.

FUNDS AVAILABLE, FISCAL YEAR 1961

Satellite-tracking Program (NASA)	$3,900,000
Celescope (NASA 51–60)	695,543
Army Ballistics Missile Agency (ABMA)	19,964
Air Force Contract 1596	22,547
Air Force Contract 6627	4,998
Air Force Contract 7414	67,786
National Aeronautics and Space Administration Grant H–3647	50,000
National Science Foundation Grant 16337	20,000
National Science Foundation Grant 16067	25,000
Total	4,805,838

DIVISION OF RADIATION AND ORGANISMS

Prepared by W. H. Klein, Chief of the Division

The research activities of the Division were continued in the general field of photobiology, and the principal efforts were directed toward a more complete description of the regulatory responses of plants that are mediated by radiant energy. The technics of biochemistry, biophysics, cytology, and plant physiology were used in evaluating both qualitatively and quantitatively the metabolic and morphological changes occurring at the cellular and subcellular level in such photoregulatory processes.

The time course of chlorophyll synthesis at various stages of development for dark-grown Black Valentine bean plants was determined. A lag phase in the rate of chlorophyll synthesis occurs when seedlings are 6 or more days old. The rate of chlorophyll synthesis can be increased by a low-level pretreatment of red radiant energy, and this red effect can be completely eliminated by following it with far-red radiant energy. Since it appeared to be a possibility that the rate-limiting factor might be a substance which was depleted from the leaves or cotyledons at about 6 days or synthesized as a result of the red pretreatment, a number of compounds were tested by infiltrating leaves to determine their effect on the lag phase. In leaves infiltrated with delta amino levulinic acid, chlorophyll synthesis was found to occur without a lag phase during the first hour of

subsequent irradiation. However, a pretreatment with red energy of delta amino levulinic acid infiltrated leaves did not increase chlorophyll synthesis, and beyond an hour of irradiation at low intensities, the rate of chlorophyll synthesis declined. At high intensities, the newly synthesized chlorophyll is destroyed.

The regulation of chlorophyll formation and the development of the photosynthetic apparatus as affected by inhibitors of protein synthesis were studied. Chlorophyll formation was inhibited at a concentration of 10 μgm./ml., and 60–80 percent inhibition occurred at 4,000 μgm./ml. Green pigments accumulating in the presence of antibiotic were chlorophylls *a* and *b*, and they were found to be present in the same ratio as in leaves treated with water instead of chloramphenicol. However, the effectiveness of chlorophyll in catalyzing photosynthesis decreased with increased concentration of chloramphenicol. Chloramphenicol does not affect the photosynthetic ability of leaves greened in its absence.

Leaves greened in the presence of chloramphenicol did not differ in their content of TPN-dependent glyceraldehyde-3-phosphate dehydrogenase from water-treated controls. Levels of carboxydismutase were somewhat lower in treated leaves. However, Hill reaction activity of a green particle fraction from leaves greened in chloramphenicol solution was only a tenth of that of the same fraction from control leaves.

The rate of chlorophyll synthesis in Black Valentine bean leaves was demonstrated to be another physiological response which is subject to the mediation of the red, far-red photomorphogenic receptor. The rate of pigment production by the chlorophyll-synthesizing mechanism in etiolated leaves can be influenced by a short preirradiation with red and far-red radiant energy. A treatment consisting of several minutes of red light, followed by an overnight period in darkness, results in appreciable stimulation in the subsequent rate of chlorophyll synthesis in continuous white light. The stimulation induced by a red pretreatment can be nullified by subsequent exposure to far-red, either immediately after the red induction or even after interposing as much as 9 hours of darkness. When red and far-red are administered alternately for several cycles, the quality of the terminal treatment controls the rate of chlorophyll synthesis. The effect of the red, far-red system on the chlorophyll-synthesizing mechanism may be due to the synthesis of pigment precursors or to changes in plastid size and/or number.

The expansion of dark-grown leaves is promoted markedly by exposure to red radiant energy. For leaf disks, the induction by red is a logarithmic function of dose over the range of 0.1 to 100 mj./cm.^{2} when given in 100 seconds. For reversal, the dose response curve is a linear function of dose, and the maximum effectiveness of the far-

red occurs about 30 minutes after induction. Preliminary measurements of the spectral sensitivity of leaf disk expansion indicate that at 546 and 577 mμ, the promotive effect is as great for equal quantum flux as at 660 mμ.

For leaves stimulated by red energy, an additional growth stimulation of expansion is exerted by cobalt ions, which also promote expansion in the dark. The maximum growth promotion due to cobalt was found to be 3×10^{-4}M. and was not found to be affected by 2,4-dinitrophenol (DNP) which uncouples oxidative phosphorylation. Adenosine triphosphate (ATP) levels in the leaf tissue were not affected by cobalt alone. However, complete deletion of ATP by DNP did not occur if cobalt ion was added simultaneously. It appears that this effect is not due to the formation of a complex between DNP and cobalt ion which is inactive in the oxidative phosphorylation process. Experiments with isolated mitochondria indicate that the cobalt ion inhibits the activity of adenosine triphosphatase, thereby increasing the net gain of ATP from oxidative phosphorylation.

The yield of chromosome aberrations induced by a given dose of X-rays is increased by supplemental far-red radiation. Since far-red energy is effective as either a pretreatment or posttreatment, it is apparently the rejoining mechanism rather than breakage per se that is affected. Alternatively, the increase of X-ray-induced aberrations may result from mitotic delay induced by far-red. These possibilities are not necessarily mutually exclusive since some particular phase of the mitotic cycle, e.g., that portion of mitotic interphase during which DNA synthesis takes place, may be preferentially affected.

Studies were conducted of cell population kinetics of root systems of broad bean, *Vicia faba*, using flash labeling with tritiated thymidine assayed by autoradiographs of squashed preparations. The relative frequency of labeled nuclei in each of the various stages of mitosis was determined for dark-grown and far-red treated material. The average duration of the mitotic cycle in *Vicia faba* was found to be 19.1 hours. Cell division required 1.8 hours, and 17.3 hours were spent in mitotic interphase. During this latter portion of the cycle, DNA synthesis occupied 9.0 hours, while presynthetic and postsynthetic interphase averaged 5.1 and 3.2 hours, respectively. There was no evidence of mitotic delay in far-red treated material. Mitotic indices, which averaged 9.2 for the far-red and 8.8 for the control series, were comparable throughout.

The responses of sporangiophores of *Phycomyces blakesleeanus* to diverging unilateral blue-light stimuli given in air were determined. It was found that 3-minute stimuli given through a thin cylindrical lens (approximately the same diameter as the sporangiophore) placed

0.15 mm. away from the sporangiophore, and with its long axis parallel to the axis of the sporangiophore, produced negative curvatures. All experiments were performed in a water-saturated atmosphere in order to prevent negative avoidance responses due to the proximity of the lens. The data support Buder's conclusion that the focusing advantage is the principal effect which produces the light gradient necessary for phototropism. When compared to data obtained from sporangiophores immersed in inert liquid fluorochemicals, the attenuation across the growing zone appears to be of the order of 10 percent. Therefore, for blue stimuli, under any irradiation conditions in which the focusing advantage is less than 10 percent, negative curvatures are produced by unilateral stimuli.

Preliminary observations were made of the growth rates of sporangiophores at intensities greater than 1.5 milliwatt/cm.^{2}, for which phototropic indifference occurs with unilateral stimuli. It was found that the growth rate increased markedly for these high intensities from the normal adapted level of 3–4 mm./hr. to 5–6 mm./hr. and was maintained at this high level for several hours.

Instruments for measuring the spectral distribution of sunlight in six wavebands from 250 mμ to 5,000 mμ were completed and mounted on the roof of the North Tower of the Smithsonian Building. Automatic recorders have been installed on the tenth floor of the Tower and measurements are being made continuously from an hour before sunrise to an hour after sunset.

PUBLICATIONS

Sisler, Edward C., and Klein, William H. Effect of red and far-red irradiation on nucleotide phosphate and adenosine triphosphate levels in dark-grown bean and Avena seedlings. Physiologia Plantarum, vol. 14, pp. 115–123, 1961.

Shropshire, W., Jr.; Klein, W. H.; and Elstad, V. B. Action spectra of photomorphogenic induction and photoinactivation of germination in Arabidopsis thaliana. Plant and Cell Physiol., vol. 2, pp. 63–69, 1961.

OTHER ACTIVITIES

During the course of the year, members of the staff attended a number of national and international scientific meetings. Dr. W. H. Klein traveled to the International Photobiology Congress in Copenhagen, Denmark, and was one of the United States representatives at the Seed Irradiation Conference in Karlsruhe, Germany. He also visited a number of laboratories in Denmark, Germany, and the Netherlands. Members of the staff who were present at the annual meeting of the American Institutes of Biological Sciences in Stillwater, Okla., were Dr. L. Loercher, L. Price, and Dr. E. C. Sisler. Papers from the Division included in the program of this meeting were: "Chlorophyll Synthesis in X-irradiated Etiolated Bean Leaf Tissue," by L. Price and W. H. Klein, and "Effect of Red and Far-red Irradiation on

Nucleotide Phosphate and Adenosine Triphosphate in Seedlings," by E. C. Sisler and W. H. Klein.

Dr. W. Shropshire participated in a Departmental Colloquium on Photobiology at Purdue University and visited laboratories at several universities in the eastern United States to confer with other investigators working in the field of phototropism.

At the 1961 meetings of the Southern Section of the American Society of Plant Physiologists at Jackson, Miss., L. Price and V. B. Elstad presented papers.

Dr. Klein opened a lecture series at Duke University, Durham, N.C., by presenting two lectures on the subject "Photoinduced Reactions in Plants and Their Action Spectra." Dr. M. Margulies attended the annual meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N.J. Dr. R. L. Latterell presented a paper at the Radiation Research Society meetings held in Washington, D.C.

Dr. Shropshire and Dr. Klein visited marine biology and photobiology laboratories in Washington and California.

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, 1961:

SMITHSONIAN ART COMMISSION

The 38th annual meeting of the Smithsonian Art Commission was held in Washington on Tuesday, December 6, 1960. Members present were Paul Manship, chairman; Leonard Carmichael, secretary; Gilmore D. Clarke, David E. Finley, Walker Hancock, Bartlett H. Hayes, Ogden M. Pleissner, Charles H. Sawyer, and Archibald G. Wenley. James C. Bradley, Assistant Secretary of the Smithsonian Institution, Theodore W. Taylor, Assistant to the Secretary, and Thomas M. Beggs, Director, National Collection of Fine Arts, were also present.

The Commission recommended reappointment of David E. Finley, Charles H. Sawyer, Paul Manship, and Archibald G. Wenley for the usual 4-year term.

The following officers were reelected for the ensuing year: Paul Manship, chairman; Robert Woods Bliss, vice chairman; and Leonard Carmichael, secretary.

The following were reelected members of the executive committee for the ensuing year: David E. Finley, chairman; Robert Woods Bliss, Gilmore D. Clarke, Archibald G. Wenley, with Paul Manship and Leonard Carmichael, ex officio.

Mr. Beggs reported on the functions of the National Collection of Fine Arts and its relation to the other Government galleries in Washington. Mr. Beggs quoted from the publication, "Art and Government, Report to the President by the Commission of Fine Arts on Activities of the Federal Government in the Field of Art, Washington, D.C., 1953," citing especially a summary of testimony it contained, which distinguished briefly between the main purposes of the three Smithsonian bureaus of fine art. He called attention to the Act of Congress of May 17, 1938, Section 4, which defines the responsibilities of the National Collection of Fine Arts. Among these are stressed authority to accept gifts of art works of both past and present and to accept funds from private sources for their purchase and

especially to encourage the development of American contemporary art. A list of references on the subject was provided.

Mr. Clarke reported that the subcommittee appointed to advise in the development of plans for housing the National Collection of Fine Arts in the Old Patent Office Building had met on December 5 and had discussed the progress made on plans for renovation of the Patent Office Building. He reviewed the architect's plans and specifications. The adaptability of the building to gallery purposes was pointed out, and the major structural change, the construction of a loading ramp and platform, was outlined. Special features discussed were off-street parking and car storage, a dining area, and the practicability of an auditorium.

Mr. Bradley stated that an appropriation had been made to the General Services Administration for the construction of a new Civil Service Building and that consequently the original Patent Office Building probably would be turned over to the Smithsonian at an earlier date than previously expected, possibly by the spring of 1963.

Dr. Carmichael requested the Commission's advice on a new operation proposed for the Smithsonian Institution. He briefly outlined the program to obtain a collection of industry-sponsored art to be used as a nucleus for traveling exhibitions, decoration of Federal offices, and possibly the decoration of Embassies and American libraries overseas, which would be supported by private funds.

The Commission recommended acceptance of the following objects for the National Collection of Fine Arts:

Marble, Napoleon Bonaparte (1808–73) by Pierre Jean David d'Angers (1788–1856). Offered by Mr. and Mrs. Fortunato Porotto, Washington, D.C.

Bronze, Abraham Lincoln (1809–65) by Augustus St. Gaudens (1847–1907). Offered by Cornelia Kremer, Washington, D.C.

Four heroic-size marble busts by William Couper (1853–1942): Jean Louis Rudolph Agassiz (1807–73), Spencer Fullerton Baird (1823–88), Benjamin Franklin (1706–90) and Joseph Henry (1797–1878). Offered by the American Museum of Natural History, New York City.

Black Belgian marble, Falcon, by Bessie Stough Callender (1889–1951). Bequest of Harold Callender, Paris, France.

Decorative wall hanging by Mary Ellen Crisp. Offered by the artist, Biddeford, Maine.

The Commission recommended the following be held for submission to the National Portrait Gallery Commission:

Oil, Judge Isaac Samuels Pennylacker (1807–47) by undetermined artist. Bequest of Dr. Bernard Samuels, Front Royal, Va.

ART WORKS LENT AND RETURNED

Institutions	*Loans*	*Returned*
American Federation of Art		1
Army Signal Corps	2	
Atomic Energy Commission		4

Bureau of the Budget	20	2
Chrysler Art Museum	1	
Civil Service Commission		4
Corcoran Galley of Art	1	1
El Paso Museum	3	3
George Washington University	1	1
Justice, Department of	4	
Lincoln Museum	1	
Lyman Allyn Museum	8	8
Military Appeals, Court of		1
Municipal Court	4	
National Gallery of Art		1
North Carolina Museum of Art	1	1
Richard Reasoner		12
State, Department of	8	4
Toronto, Art Gallery of	5	5
Truxton-Decatur Naval Museum	1	
United States District Court	3	1
United States National Museum, Division of Military History		8
Vancouver Art Gallery	4	4
Virginia Museum of Fine Arts	1	
The White House	9	26
Whitney, Gertrude Vanderbilt, Museum of Western Art	1	1
Whitney Museum of American Art	5	5
Wichita, University of	1	
Winnipeg Art Museum	5	5
	89	98

SMITHSONIAN LENDING COLLECTION

The following four oils, transferred from the White House, were added December 6, 1960:

Undetermined title, by Gatti Annibale (1827–1909). Presented to the President by H. E. Giovanni Gronchi, President of the Republic of Italy.

Canada Ojeda, by Ameliano del Castillo. Presented to the President by the Director of Radio Station "La Voz de Guadix," Enrique Caroles Tarrago, Guadix, Granada, Spain.

Prado do Les Aninas, by Benjamin Palencia. Presented to the President by the Mayor of Madrid, Jose De Romani, Finat y Escrina, Count of Mayalde.

Francisco De Vitoria, by Varquer. Presented to the President by H. E. General Francisco Franco.

ART WORKS LENT AND RETURNED

Institutions	*Loans*	*Returned*
Federal Communications Commission		3
Florida Artists Group	35	35
Florida Gulf Coast Art Center	35	35
Labor, Department of		3
Lehigh University		1
Meltzer Gallery		24
Naples, Florida Artists Group	35	35

Post Office Department	4	
U.S. District Court	4	
The White House		6
	113	142

THE HENRY WARD RANGER FUND

The following paintings purchased previously but not assigned have been allocated to the institutions indicated:

Title and artist	*Assignment*
214. Yesterday and Before and Before, by Loring W. Coleman (1918–).	The Canton Art Institute, Canton, Ohio.
228. Sag Harbor, by Nicolai Cikovsky (1894–).	Yankton College, Yankton, S. Dak.

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 6, 1960.

No. 105. The Pale Light of Dawn, by Spencer Nichols, N. A. (1875–1950), was returned to the Society of Liberal Arts, Joslyn Memorial, Omaha, Nebr., where it was originally assigned in 1932.

No. 37. The Bathers, by Spencer Nichols, N. A. (1875–1950), was returned to the Art Hall, Beloit College, Beloit, Wis., where it was originally assigned in 1924.

The following paintings, purchased by the Council of the National Academy of Design since the last report, have been assigned as follows:

Title and artist	*Assignment*
234. Wreck of the Sea Prince (watercolor), by John C. Pellew (1903–).	College of Fine and Applied Arts, University of Illinois, Urbana, Ill.
235. Espresso Magnifico, by Franklin Robbins (1917–).	City College, New York, N.Y.
236. Equestrian Acrobats, by Jon Corbino (1905–).	Howard University, Washington, D.C.
237. Bass Rocks (watercolor), by Morton Roberts (1927–).	Iowa State University, Ames, Iowa.
238. White Mountain (watercolor), by Adolf Dehn (1895–).	Assignment pending.
239. Venezia (watercolor), by Robert T. Handville (1924–).	University of Denver, Denver, Colo.
240. Nut Street Station (watercolor), by Dong Kingman (1911–).	Assignment pending.
241. My Neighbor's Place (watercolor), by Harry Anderson (1906–).	West Point Museum, West Point, N.Y.

Title and artist	*Assignment*
242. Posted (watercolor), by John De Tore (1902–).	Malden Public Library, Malden, Mass.
243. Barn in Friendship (watercolor), by Frederick P. Krause (1918–).	The Leland Stanford Junior University, Stanford University, Calif.
244. Morning in the Cove (watercolor), by Milford Zornes (1908–).	Rock Springs High School Art Project, Rock Springs, Wyo.
245. Reclining Woman (watercolor), by John Russell (1928–).	Rensselaer County Historical Society, Troy, N.Y.

SMITHSONIAN TRAVELING EXHIBITION SERVICE

In addition to the 65 exhibits held over from previous years as indicated, 56 new shows were introduced. The total of 121 of these were circulated to 314 museums in the United States.

EXHIBITS CONTINUED FROM PRIOR YEARS

1955–1956: Chinese Ivories from the Collection of Sir Victor Sassoon.

1956–1957: Contemporary German Prints; Architectural Photography II; Japan II by Werner Bischof; and The World of Edward Weston.

1957–1958: The American City in the 19th Century; Recent American Prints; Japanese Woodblock Prints; Theatrical Posters of the Gay Nineties; Birds by Emerson Tuttle; Contemporary Portuguese Architecture; Nylon Rug Designs; Burmese Embroideries; Japanese Dolls; Thai Painting; The Anatomy of Nature; Photographs of Sarawak; Glimpses of Switzerland; Art in Opera II—Carmen; The Four Seasons; Children's Paintings from Morocco; Drawings by European Children; Photographs of Angkor Wat; and Pup, Cub and Kitten.

1958–1959: German Artists of Today; Advertising in 19th Century America; The Engravings of Pieter Brueghel the Elder; Three Danish Printmakers; Charles Fenderich—Lithographer of American Statesmen; Drawings from Latin America; Contemporary Religious Prints from the Sloniker Collection; Religious Subjects in Modern Graphic Arts; Contemporary French Tapestries I; Our Town; Stone Rubbings from Angkor Wat; Shaker Craftsmanship; The Unguarded Moment, Photographs by Erich Salomon; Children's Paintings from India; A Child Looks at the Museum; and Swiss Children's Paintings.

1959–1960: The Art of Seth Eastman; Contemporary Greek Painting; Early Drawings by Toulouse-Lautrec; Watercolors and Drawings by Thomas Rowlandson; Prints and Drawings by Jacques Villon; American Prints Today; Brazilian Printmakers; Lithographs of Fantin-Latour; Arts and Cultural Centers; Bernard Ralph Maybeck; Enamels; Eskimo Art; Contemporary French Tapestries II; Contemporary American Glass; Story of American Glass; Bazaar Paintings from Calcutta; Gandhara Sculpture; Sardinian Crafts; Arctic Riviera; Photographs by Robert Capa II; Outer Mongolia; Pagan; Portraits of Greatness; Contrasts; and Paintings by Young Africans.

EXHIBITIONS INITIATED IN 1961

Paintings and Sculptures

Title	*Source*
Work by Torres Garcia	Rose Fried Gallery; private collectors.
Three Swiss Painters	The Akron Art Institute; Basel Kunthalle and Winterthur Museum.
The Technique of Fresco Painting	Michelangelo Muraro, Deputy Superintendent of Monuments in Venice; Italian Embassy.
Folk Painters of the Canadian West	National Gallery of Canada, Ottawa; Canadian Embassy.
Paintings by Ch'i Pai-Shih	Yakichiro Suma, Director of the Chuo University in Tokyo.
Birds of Greenland	Gitz-Johnsen; Embassy of Denmark, The Carlsberg Foundation, Copenhagen.
A Tribute to Grandma Moses	Galerie St. Etienne, New York; Dr. Otto Kalir.

Drawings and Prints

The America of Currier and Ives	Prints and Photographs Division, Library of Congress.
View 1960	Thomas M. Messer, Director of the Institute of Contemporary Art, Boston.
Drawings by Sculptors	Museums; private collectors; artists; Miss Jane Wade, Otto Gerson Gallery, New York City.
The Graphic Art of Edvard Munch	Lessing J. Rosenwald; National Gallery of Art.
German Color Prints	Selection from the 1959 exhibition, "Farbige Graphik"; German Embassy.
Eskimo Graphic Art	Eskimo Art, Inc., Ann Arbor, Mich.
Civil War Drawings I	American libraries; Library of Congress.
Civil War Drawings II	American libraries; Library of Congress.
American Art Nouveau Posters	Prints and Photographs Division, Library of Congress.
American Industry in the 19th Century	Prints and Photographs Division, Library of Congress.
America on Stone	Harry T. Peters Collection, Smithsonian Institution.
Printing in the Netherlands	Graphic Export Centre, Amsterdam; The Royal Netherlands Embassy.
Italian Drawings	Gabinetto Disegni Galleria degli Uffizi, Florence, Italy; Dr. Giulia Sinibaldi and Dr. Maria Fossi Todorow; Italian Embassy.

Oriental

Designed in Okinawa	Ryukyuan Islands museums; Honorable Jugo Thoma, Chief Executive of the Islands; Lt. Gen. Donald P. Booth, U.S. High Commissioner.
Okinawa—Continuing Traditions	Ryukyuan Islands museums; Honorable Jugo Thoma, Chief Executive of the Islands; Lt. Gen. Donald P. Booth, U.S. High Commissioner.
Prints by Munakata	Chisaburoh Yamada, Tokyo; Print Club of Cleveland Museum of Art.
Contemporary Japanese Drawings	Atsuo Imaizumi, Deputy Director, National Museum of Modern Art, Tokyo; Japanese Embassy.
Japan: Design Today	Japan Society, Inc., New York.
The Spirit of the Japanese Print	James A. Michener, Author; Charles E. Tuttle Company.
Americans—A View from the East	Collection of Carl Boehringer.
The Way of Chinese Landscape Painting.	Dr. Fritz van Briessen, German Foreign Service Officer, Tokyo; Museum of Modern Art, Tokyo.

Architecture

Swiss Industrial Architecture	Federation of Swiss Architects; Pro Helvetia Foundation; Swiss Embassy.
Contemporary Swedish Architecture	National Association of Swedish Architects and Swedish Institute.
Mies van der Rohe	American Institute of Architects, Washington, D.C.
Irish Architecture of the Georgian Period.	Royal Institute of Architects of Ireland; Bord Failte Eireann; Irish Embassy.
One Hundred Years of Colorado Architecture.	Colorado Chapter of American Institute of Architects; F. Lamar Kelsey, Chairman, Exhibits Committee.
Brasilia—A New Capital	Brazilian Embassy.

Design and Crafts

Scenic Designers Offstage	Corning Museum of Glass; United Scenic Artists.
Design in Germany Today	West German Government; Dr. Hans Eckstein, Director, Museum of Applied Arts, Munich; German Embassy.
Fibers, Tools and Weaves	Paul John Smith of the American Craftsmen's Council.
Designed for Silver	Museum of Contemporary Crafts; Yale University Art Gallery.
Batiks by Maud Rydin	Museum of Contemporary Crafts, New York; Swedish Embassy; artist.
American Textiles	Index of American Design, National Gallery of Art.

Photography

The Seasons, color photographs by Eliot Porter.	The Artist.
The World of Werner Bischof	Magnum Photos, Inc.; Embassy of Switzerland; Pro Helvetia.

Science

The Image of Physics	Miss Berenice Abbott; Physical Science Study Committee of Educational Services, Inc., Watertown, Mass.
Charles Darwin: The Evolution of an Evolutionist.	American Museum of Natural History.
The Beginnings of Flight	The William J. Hammer Collection of Aeronautical Photographs; Paul Garber, National Air Museum, Smithsonian Institution.
Two Centuries of Danish Deep Sea Research.	Hans Madsen, Zoological Museum, Copenhagen; scientific committee, Dr. Erik Bertelsen, Director, Danish Fishery Research; Dr. Anton Bruun, Dr. Ragnar Sparck and Dr. Helge Volsoe, University of Copenhagen; Danish Embassy, King Frederik and Queen Ingrid.

History

The Magnificent Enterprise. Education Opens the Door.	Campo Photocolor Exhibits; Vassar College Centennial Celebration.
The New Theatre in Germany	Pepsi-Cola Company; German Embassy.
Tropical Africa I	Twentieth Century Fund; George H. T. Kimble, Chairman, Department of Geography, University of Indiana.
Tropical Africa II	Twentieth Century Fund; George H. T. Kimble, Chairman, Department of Geography, University of Indiana.

Children's Exhibitions

Symphony in Color	John Herron Art Institute; Junior Group of the Indianapolis Symphony Orchestra.
Paintings and Pastels by Children of Tokyo.	New York-Tokyo Sister City Affiliation; Tokyo Society for Art Education.
Children's Art from Italy	Junior Museum of the Metropolitan Museum of Art, New York; Professor Sergio Pagiaro.
Hawaiian Children's Art	Honolulu Academy of Arts.
Designs by Children of Ceylon	Junior Museum of the Metropolitan Museum of Art; Art Inspector of Ceylon.
Children's Paintings from Chile	Mrs. Walter Howe, wife of Ambassador of Chile; Museum of Fine Arts, Santiago.

INFORMATION SERVICE AND STAFF ACTIVITIES

In addition to the approximately 16,000 requests for information received by mail and telephone, inquiries made in person at the office numbered 1,500. In all, 167 works of art were examined by the Director.

Special catalogs were published for the following traveling exhibitions: Italian Drawings, Sardinian Crafts, Irish Architecture of the Georgian Period, and The World of Werner Bischof. A special catalog of Traveling Exhibitions for 1961–62 was also published. A 64-page illustrated brochure containing a cover design and introduction by Thomas M. Beggs was published for the Arts and Archeology of Viet-Nam exhibition.

The director visited several European countries to study art galleries, their establishment, and their relationships with government and other organizations, to confer with museum officials, collectors, and donors to the collections, and also to inspect historic buildings in process of restoration.

Six paintings in oil on canvas from the permanent collections were cleaned and revarnished, and 28 picture frames were repaired and refinished with the assistance of Buildings Management Service, which constructed and finished frames for four etchings.

Albert C. Wagner restored the French Ship model (No. 442) in the Gellatly Collection and Joseph Ternbach restored the following items from that collection: two Oriental pins, gold and glass (No. 187); Saint, alabaster (No. 377); Spanish King, wood (No. 569); St. George, wood (No. 381); St. Peter, alabaster (No. 378).

Contracts were let for the relining and restoring by Harold F. Cross of the following: Ariadne, by Wyatt Eaton; Charles G. Abbot, by Nicholas Brewer; Pegasus, by Albert P. Ryder; Robert Hare, by Alvan Clark; Richard Delafield, by Charles C. Curran; Cup of Death, by Elihu Vedder; Laura Alice, by Alice Pike Barney; The Brown Kimona, by Irving Wiles; Italian Woman and Child, by Alice Pike Barney; and two small landscapes by Alice Pike Barney.

Henri G. Courtais is under contract for renovation of the following paintings: St. Ursula, by undetermined artist; Virgin Enthroned, by Abbott H. Thayer; Thomas George Hodgkins, by Robert Gordon Hardie; Spencer Fullerton Baird, by Robert Gordon Hardie; Richard Rush, by T. W. Wood; Joseph Henry, by Henry Ulke;; Charles Doolittle Walcott, by Samantha B. Huntley; Ruins, by Francesco Guardi; Young Girl Seated, by Thomas Dewing; Music, by Thomas Dewing; The Golden Age, by John LaFarge; Amagansett to East Hampton, by George Bogert; Duchess of Ancaster, by Sir Joshua Reynolds; Mrs. Price, by William Hogarth; Smuggler's Notch, by Chauncey Ryder; The Island, by Edwin W. Redfield; and Viscountess Hatton, by Sir Peter Lely.

SPECIAL EXHIBITIONS

July 15 through August 7, 1960. Folk Art from Rumania, circulated by the Smithsonian Traveling Exhibition Service, consisted of colorful costumes, embroideries, rugs, ceramics, icons, musical instruments, photomurals of villages and buildings, together with a reconstructed room from a cottage in the district of Transylvania. A brochure was privately printed.

August 14 through September 8, 1960. Fourth Biennial Creative Crafts Exhibition, sponsored by the Ceramic Guild of Bethesda, Cherry Tree Textile Designers, Clay Pigeons Ceramic Workshop, Designers-Weavers, Potomac Craftsmen, and the Kiln Club of Washington, consisted of 220 items including 116 ceramics and glass, 77 textiles, 15 metalwork, 6 jewelry, and 6 mosaic. A catalog was privately printed.

September 17 through October 6, 1960. 67th Annual Exhibition of the Society of Washington Artists, consisted of 70 paintings and 27 sculptures. A catalog was privately printed.

October 13 through November 10, 1960. Two Centuries of Danish Deep Sea Research, circulated by the Smithsonian Traveling Exhibition Service, consisting of maps, photographs, charts, specimens, and scientific equipment. A brochure was privately printed.

October 26 through December 8, 1960. Art and Archeology of Viet Nam, sponsored by the Embassy of Viet Nam, centered about the Cham Civilization supplemented by contemporary crafts. It consisted of 148 archeological items (including the Oc-eo treasure) lent by the Vietnamese National Museums of Saigon and Hue and augmented by loans from the Peabody Museum, Harvard University, Musees Royaux du Cinquantenaire, Brussels, Belgium, and private collectors. There were also shown, in Hall 22, Natural History Building, 196 contemporary crafts items from Viet Nam.

Following its showing at the National Collection of Fine Arts, the exhibition was divided to be circulated in two sections as follows: Archeological section—Baltimore Museum of Art; Cleveland Museum of Art; University Museum of University of Pennsylvania, Philadelphia; City Art Museum of St. Louis; Portland Art Museum; and University of California, Berkeley; contemporary crafts section—Columbia University; Brandeis University; Michigan State University; and Fine Arts Gallery of San Diego. An illustrated catalog was printed.

November 27, 1960, through January 5, 1961. Twenty-third Anniversary of the Metropolitan Art Exhibition, sponsored by the American Art League, consisted of 163 items, including 129 paintings, 14 prints and drawings, and 20 sculptures. A catalog was privately printed.

December 9, 1960, through January 10, 1961. Aviation Paintings and Drawings by Charles H. Hubbell, sponsored by the National Air Museum, consisted of 150 paintings. A catalog was privately printed.

January 15 through February 5, 1961. The Victorian American, circulated by the Smithsonian Traveling Exhibition Service, consisting of a selection of 100 lithographs from the Harry T. Peters Collection.

February 11 through March 5, 1961. The World of Werner Bischof, sponsored by the Ambassador of Switzerland and circulated by the Smithsonian Traveling Exhibition Service, consisted of 80 photographs.

March 12 through April 2, 1961. The 64th Annual National Exhibition of the Washington Water Color Association, consisting of 104 paintings. A catalog was privately printed.

April 9 through April 30, 1961. New Jersey Chapter American Artists Professional League, sponsored by the New Jersey State Society of Washington, D.C., consisted of 107 paintings and 2 sculptures. A catalog was privately printed.

April 20 through April 29, 1961. Coins and Currency of Yesteryears, sponsored by the Washington Numismatic Society.

May 6 through May 28, 1961. The New Theater in Germany, sponsored by the Ambassador of the Federal Republic of Germany and circulated by the Smithsonian Traveling Exhibtion Service, consisted of photographs showing German stage design, architecture, drama schools, and organization of theaters. A brochure was privately printed.

May 7 through May 28, 1961. The Twenty-Eighth Annual Exhibition of the Miniature Painters, Sculptors, and Gravers Society of Washington, D.C., consisting of 179 items. A catalog was privately printed.

May 26 through 30, 1961. Exhibition commemorating the 100th Anniversary of the birth of Rabindranath Tagore, sponsored by the Embassy of India, consisted of 40 reproductions of paintings by Tagore.

June 3 through 25, 1961. Washington Religious Art Exhibition, sponsored by the National Conference of Christians and Jews, Washington, D.C., Region, consisted of 103 items including 74 paintings and prints, 16 sculptures, 10 ceramic and glass objects and 3 textiles. A catalog was privately printed.

June 9 through August 13, 1961. The World of Shells, a special exhibition in connection with the annual meeting of the American Malacological Union.

Respectfully submitted.

THOMAS M. BEGGS, *Director.*

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the Freer Gallery of Art

SIR: I have the honor to submit the forty-first annual report on the Freer Gallery of Art, for the year ended June 30, 1961.

THE COLLECTIONS

Forty-one objects were added to the collections by purchase as follows:

BRONZE

60.18. Chinese, Shang dynasty. Vessel of the type *ting*. Decorations in relief and in intaglio with cuprite and quartz filling up the fossae. One inscription inside of one or maybe two characters. Over-all height, 0.245; diameter, 0.186.

60.19 Chinese, Chou dynasty, ca. 10th-9th century B.C. Ceremonial vessel of the type *kuei*, with two handles, a cover and three short legs. The cast decorations (fluting and animal bands) are mostly in low relief except for the handles which are in the round. Patination of gray-green tin oxide is spotted here and there with touches of cuprite. Inscription of 36 characters in top and bottom. Height, 0.249; diameter, 0.263.

60.20 Chinese, Chou dynasty, Vessel of the type *yu*. Body of vessel is decorated with two bands near top and base, and cover of vessel has one band. Bail handle is more ornate, being affixed by rings and terminating in animal heads in the round. Patina is dark green, and decorations are in low relief and intaglio. Inscription in top and bottom is in 28 characters. Over-all height, 0.222; width, 0.197.

61.3. Chinese, Han dynasty, 206 B.C.-A.D. 221. Dragon. Decoration over-all in intaglio and very low relief. This animal is cast in the round; light gray-green patina. Height, 0.193; length, 0.366; width, 0.137.

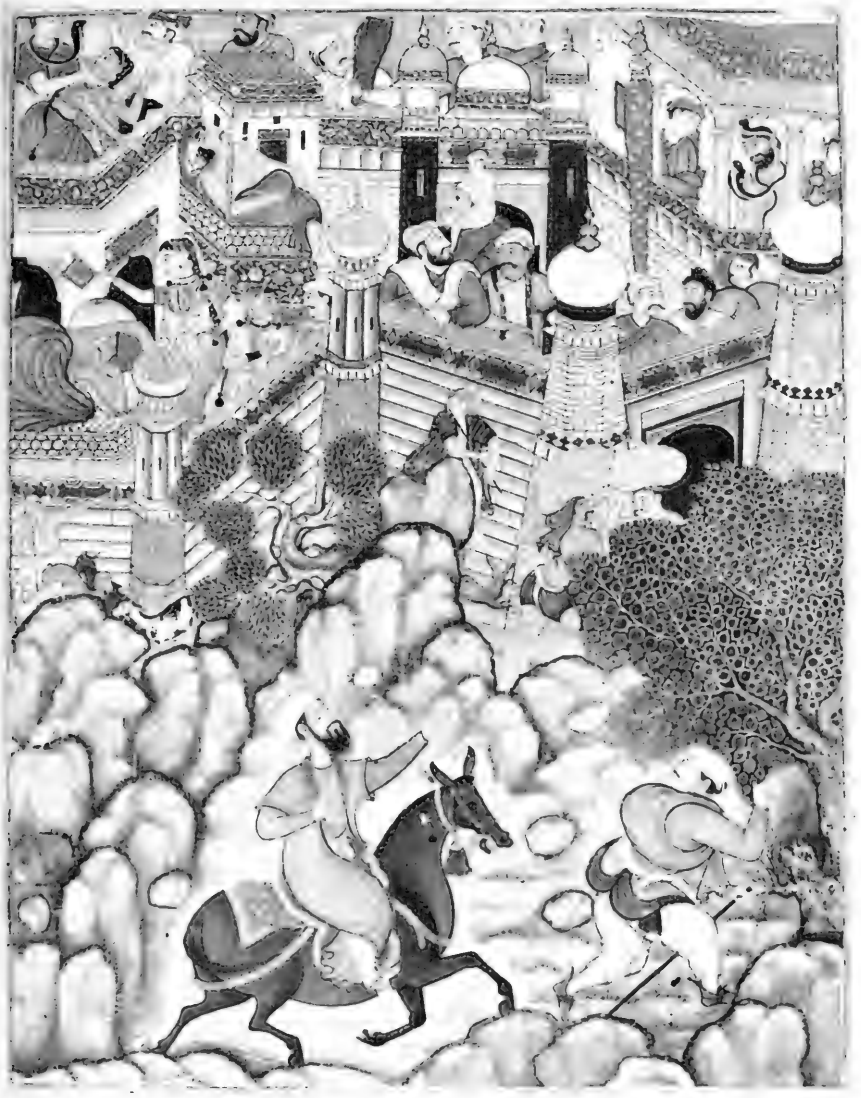
METALWORK

61.12. Chinese, Ming dynasty, 16th century. Squat tripod of copper covered with cloisonné enamels in red, white, blue, green, yellow, and aubergine on light blue ground; lotus scrolls around sides and fruit underneath; elaborate gilt feet and handles of later date; carved wood cover and jade finial. Minor repairs. Over-all height, 0.181; height without cover, 0.140; diameter, 0.190.

61.22. Persian, Parthian period, 3d-1st century B.C. Heart-shaped gold ornament, possibly part of buckle, with two boars in a thicket indicated by leaves; cast mostly in high relief with black resin filling the void in back, heads in the round. Ten small loops evenly spaced along edge of back served for sewing on. Height, 0.053; width, 0.050; depth, 0.010.

PAINTING

60.24. Chinese, Ming dynasty, by Tung Ch'i-ch'ang (1555–1636). Landscape: ink on paper. One inscription and six seals on the painting. Kakemono; height, 1.282; width, 0.383.



60.15
Recent addition to the collections of the Freer Gallery of Art.

60.16
Recent addition to the collections of the Freer Gallery of Art.

60.25
Recent addition to the collections of the Freer Gallery of Art.

61.8

Recent addition to the collections of the Freer Gallery of Art

60.25. Chinese, Ch'ing dynasty, by Hua Yen (1682–1755). Ten album leaves of birds, flowers, etc.; ink and colors on paper. Average dimensions: height, 0.318; width, 0.454. (Illustrated.)

60.26. Chinese, Ming dynasty, 16th century, dated 1547, by Ch'iu Ying. Narcissus and flowering apricots in ink and colors on paper. Kakemono: height, 0.495; width, 0.246.

61.10. Chinese, Ming-Ch'ing dynasty, by Ch'en Hung-shou (1599–1652). Album of eight leaves: landscapes and figures. Signature of artist and one seal plus one collector's seal on each leaf. Inscriptions (quatrains) by the artist on opposite leaves, each with signature and two seals. Two inscriptions and eight seals on double leaf following paintings; ink and colors on paper. Average dimensions: height, 0.335; width, 0.273.

61.11. Chinese, Ch'ing dynasty, by Kung Hsien (b. ca. 1610, d. 1689). Winter landscape; two seals on painting and two on mount. Album leaf in ink on paper. Height, 0.205; width, 0.340.

60.14. Indian, third quarter of 16th century (ca. 1560–80), Mughal period, school of Akbar. "Sa'īd arrives with Khūsh Khurrām on the roof of the castle; sees two girls wrestling." Miniature from *Ḥamza-nāma*, executed for Emperor Akbar. One of a set: 49.18 and 60.15. Painting: height, 0.676; width, 0.513.

60.15. Indian, third quarter of 16th century (ca. 1560–80), Mughal period, school of Akbar. "Umar in disguise of surgeon Mizzmuḥīl arrives before the Fort of Antalya (?)." Miniature from *Ḥamza-nāma*, executed for Emperor Akbar. One of a set: 49.18 and 60.14. Painting: height, 0.673; width, 0.512. (Illustrated.)

60.27. Indian, end of 16th century, Mughal period, school of Akbar. "Prince Salīm with a courtier and attendants in a tent." Painted in gold and colors; framed by gold-flecked borders of various widths to form part of an album. Inscription in *devanagari* characters on back. Painting: height, 0.170; width, 0.114.

60.28. Indian, ca. 1595, Mughal period, school of Akbar. "Akbar, enthroned, gives an audience before a pavilion." Painted in gold and colors. Akbar's nose and forehead repainted; small piece of pigment below vizier's mouth chipped off. Framed by inner buff border with floral decoration in gold; outer border rose-colored and gold-specked. Painting: height, 0.261; width, 0.142.

60.17. Japanese, Ashikaga period, Idealistic Chinese school, 16th century, attributed to Gakuō. Rocky landscape with wild geese; ink and colors on paper. Kakemono: length, 0.440; width, 0.330.

60.21. Japanese, early Momoyama period, Tosa school, late 16th century. Battle scene. Fan-shaped; ink, color, and gold leaf on paper. Kakemono: height, 0.245; width, 0.545.

60.22. Japanese, Edo period, Nanga school, by Ikeno Taiga (1723–76). "One hundred old men gathering for a drinking party"; ink, color, and gold on silk. Makimono: height, 0.538; width, 2.923.

60.23. Japanese, early Ashikaga period, by Kaō (fl. in 14th century). Kanzan; ink monochrome on paper. Kakemono: height, 1.025; width, 0.309.

60.31. Japanese, Edo period, Decorative school, by Sākai Hōitsu (1761–1828). "The thirty-six master poets"; ink, colors, and gold on silk. Kakemono: height, 1.361; width, 0.677.

61.1–61.2. Japanese, Edo period, Nanga school, by Baiitsu (1789). Landscape. A pair of six-fold screens in ink and slight colors on paper. Painting: height, 1.530; width, 3.556.

61.4– Japanese, Edo period, Nanga school, by Buson (1716–83). Landscape,

61.5. figures and wind in willows. A pair of six-fold screens in ink and colors on silk. Height, 1.665; width, 3.710.

61.6. Japanese, Heian period, Buddhist school, 12th century. Nyoirin Kannon; ink, colors, silver, and gold on silk. Kakemono: height, 0.777; width, 0.405.

61.8. Japanese, Ashikaga period, Tosa school, artist unknown. *Utatane Monogatari* (The tale of Utatane); ink and color on paper. Makimono; height, 0.138; width, 10.873. (Illustrated.)

POTTERY

60.13. Chinese, Shang dynasty. Figure of a crouching stag with horns; fine-grained light buff stoneware; hollow with opening in back; linear designs all over body and head. Height, 0.172; length, 0.175; width, 0.063.

60.16. Chinese, T'ang dynasty, *San-ts'ai* ware. Figure of a seated man with black beard and Armenian features holding a wine skin; buff stoneware with transparent glaze. Height, 0.332; width, 0.173. (Illustrated.)

60.29. Chinese, T'ang dynasty, *San-ts'ai* ware. Figure of a standing female; buff stoneware with transparent glaze; finely crackled; unglazed head shows remains of painting. Height, 0.353; width, 0.156.

61.13. Chinese, Ch'ing dynasty. Ovoid vase with tall cylindrical neck; fine-grained white porcelain with transparent glossy glaze decorated in colored enamels over glaze; a landscape with palaces; poem of 14 characters; three simulated seals; four-character Ch'ien-lung mark in blue enamel on base. Height, 0.196; width, 0.098.

61.14. Chinese, Ming dynasty, early 15th century. Large dish with plain rim and unglazed base; fine white porcelain with transparent, thick glaze with some orange-peel effect; decorated in underglaze blue; a control landscape with rock, coxcomb, etc., and eight flower and fruit sprays in cavette; outside, "three friends." Height, 0.095; diameter, 0.680.

61.15. Chinese, Ch'ing dynasty, early 18th century (K'ang-hsi). Dish with rim of interlocking rings; fine white porcelain with transparent glaze, decorated in overglaze famille verte enamels and gold, dragons and floral patterns, iron-red dragon on base. Height, 0.045; width, 0.105.

61.16. Chinese, T'ang dynasty. Low round box with cover; creamy white porcelain, medium grain, with transparent, smooth, off-white glaze and no decoration. Height, 0.045; diameter, 0.105.

61.17. Chinese, Sung dynasty, *ting* ware. Dish with plain rim bound in brass; fine, off-white porcelain with transparent glaze with teardrops outside. Decorated with fish and lotus plants inside. Height, 0.060; diameter, 0.304.

61.18. Chinese, Sung dynasty, *ting* ware. Dish with plain rim bound in copper; fine off-white stoneware with transparent glaze with teardrops outside; decorated with molded bird and flower patterns inside. Height, 0.056; diameter, 0.291.

61.19. Chinese, Sung dynasty, northern celadon. Bowl with small foot and slightly flaring rim; grayish-brown stoneware with transparent, grayish-green bubbly glaze; molded decoration inside of two babies amid flowering vines. Height, 0.049; diameter, 0.121.

61.20. Chinese, Sung dynasty, northern celadon. Bowl with small foot and slightly flaring rim; grayish-brown stoneware with transparent, grayish-green bubbly glaze; decorated inside with molded fish among waves. Height, 0.037; diameter, 0.094.

60.30. Japanese, Momoyama period, *oribe* ware. Tray in the form of two fans with vertical sides and arching handles; coarse, buff stoneware with transparent glaze, decorated with brown, green, and white designs. Over-all height, 0.143; width, 0.234.

61.9. Japanese Momoyama period, *shino* ware. Round dish with lip folded in and squarish at the rim; three low loop feet and three spurmarks; rough stoneware with thick, bubbly crackled, mottled reddish-brown and gray glaze; decorated with floral designs in white slip under glaze. Height, 0.057; width, 0.170.

61.7. Mesopotamian, 10th century. Bowl of pale yellow-brown luster painted on a tin glaze; the design on the interior is a horseman turned toward the right holding a flag; broken and repaired, but only tiny pieces missing and replaced by plaster. Height, 0.058; diameter, 0.235.

61.21. Persian, mid-12th century, *lakabi* ware; large platter with carved design of horseman wielding a sword; set against arabesque background. Broken and mended with few missing pieces replaced by plaster. Height, 0.086; diameter, 0.408.

REPAIRS TO THE COLLECTION

Fifteen Chinese, Japanese, and Korean objects were restored, repaired, or remounted by T. Sugiura. In addition, one large rubbing was mounted for the University of Michigan and repairs or remounting completed for six Japanese screens in private collections. Repairs and regilding of 18 frames for American paintings were done outside the Gallery.

CHANGES IN EXHIBITIONS

Changes in exhibitions amounted to 134, as follows:

American art:		Japanese art:	
Oils	18	Paintings	18
Chinese art:		Pottery	5
Bronze	8	Wood sculpture	2
Paintings	2	Korean art:	
Pottery	6	Bronze	3
Stone sculpture	1	Jade	7
Christian art:		Metalwork	6
Crystal	1	Paintings	3
Glass	2	Pottery	19
Gold	6	Near Eastern art:	
Indian art:		Metalwork	2
Paintings	2	Paintings	12
		Pottery	10
		Stone sculpture	1

LIBRARY

One of the high spots of the year was the "Bronze Symposium" held at the Freer Gallery, which brought specialists from all over the United States, Canada, and Australia. An exhibition of books in this special field was arranged in the library and proved a busy place during the visitors' free time.

During the year 594 acquisitions were added to the library by title, 267 by gift and exchange from other institutions and individuals,

and 327 by purchase. Among the outstanding purchases were *Nihon shūcho shina-kodō seika* (selected relics of ancient Chinese bronzes from collections in Japan), compiled by Sueji Umehara and issued in a limited edition in six volumes, 1960–61; *Shōsōin Homotsu* (treasures of the Shōsōin), which is to be completed in 1962 in three folio volumes; *Figure prints of Old Japan, a pictorial pageant of actors and courtesans of the eighteenth century reproduced from the prints in the collection of Marjorie and Edwin Grabhorn*, with an introduction by Harold P. Stern, San Francisco, 1959. Xerographic copies of microfilms of two rare manuscripts were made. (1) *Tōban shimpin zukan* (album of sword guard masterpieces). This illustrated manuscript written in 1783 (De Rosny's catalogue) and never published is now in the Kungliga Biblioteket, Stockholm, Nordenskjöld Collection, No. 525. In 1912 Henri L. Joly made a copy and translation and issued privately 15 copies, none of which has been located. (2) *Wu Ch'i-chen shu-hua chi* (record of calligraphy and painting seen by the author, Wu Ch'i-chen), written in mid-17th century giving the descriptions of the works, comments, and information on the collections owning them, with the dates on which he saw them. Six volumes of text with one volume of catalogue or index. A copy of the manuscript is in the *Ssu-k'u-ch'üan-shu* (the good repository of manuscripts of Chinese books) but the book was never printed(?). The copy in the Gunnar Martin Collection, Stockholm, was presumably copied from the *Ssu-k'u-ch'üan-shu* manuscript, and is the only copy outside China(?). The book is of particular importance because the author saw many of the important collections of his day and records their contents carefully. Many of the paintings he describes are still extant in the Ku-kung Collection, the Freer Gallery of Art, and other collections. Two outstanding gifts were *Chinese painting*, by James F. Cahill, Geneva, Skira, 1960 (gift of author); *Persian painting* by Basil Gray, Geneva, Skira, 1961 (gift of publisher).

The year's record of cataloging included a total of 967 entries of which 534 analytics were made, and 197 new titles of books, pamphlets and scrolls were cataloged. Only one-ninth of the cards required were available in printed cards from the Library of Congress.

The current state of the cataloging has given opportunity for special projects. Mrs. Hogenson began indexing the correspondence of Charles Lang Freer. Mrs. Usilton prepared a subject index for Technical Studies in the Field of Fine Arts, vols. 1-10; revised and enlarged the Bibliography for the *Chinese Outline;* and continued to serve as assistant editor of *IIC Abstracts: Abstracts of the Technical Literature of Archaeology and the Fine Arts.*

There were 162 requests for bibliographic information by telephone and letter. In all, 515 scholars and students who were not

members of the Freer staff used the library. Thirteen of these saw and studied the Washington Manuscripts and five came to see the library installation. Students at Columbia University and Catholic University of America, who were completing their graduate work in library science, made surveys of the library as a part of their required studies.

Lou Cushing Harden, University of Rochester, served as volunteer for the intern program for the summer. This program is intended to give students a rounded experience in the general operation and purposes of a gallery, and to broaden their familiarity with the field of art in general.

PUBLICATIONS

Two publications were issued by the Gallery as follows:

Ars Orientalis, Vol. IV. 17 articles in English, French, or German, 21 book reviews, 1 bibliography, 5 notes, 2 memorials. 462 pp., 143 collotype pls., text ill. (Smithsonian Institution Publication 4431.)

Second presentation of the Charles Lang Freer Medal, a brochure issued in conjunction with the presentation to Prof. Ernst Kühnel, May 3, 1960, honoring this eminent scholar for his outstanding contributions and achievements in the field of Near Eastern art.

Publications of staff members were as follows:

Cahill, James F. Chinese art treasures. (See under Pope.)

———. Chinese painting. Geneva, Skira, 1960. 211 pp. with 100 col. ills. (Treasures of Asia.)

———. The Chinese Imperial art treasures. *Horizon, a magazine of the arts*, vol. 3 (Jan. 1961), pp. 14–25, 8 col. pls.

———. "Concerning the I-p'in style of painting," by S. Shimada. Translated by James F. Cahill. *Oriental Art*, n.s., vol. 7 (summer 1961), pp. 66–74.

———. Confucian elements in the theory of painting. In "The Confucian Persuasion," edited by Arthur F. Wright. Stanford, Stanford University Press, 1960, pp. 115–140.

———. A rejected portrait by Lo P'ing; pictorial footnote to Waley's *Yüan Mei. Arthur Waley anniversary volume*, London, Lung Humphries, 1959, pp. 32–39, pls.

———. The Six Laws and how to read them. *Ars Orientalis*, vol. 4 (1961), pp. 372–381.

———. Review of "Some T'ang and pre-T'ang texts on Chinese painting." Edited and translated by W. R. B. Acker. *Ars Orientalis*, vol. 4 (1961), pp. 440–444.

Ettinghausen, Richard. Automata: Islam. *Encyclopedia of world art*, New York, 1960, vol. 2, cols. 185–186, pl. 77. (Also published in Italian edition, Rome, 1960.)

———. The Emperor's choice. *De Artibus opuscula XL: Essays in honor of Erwin Panofsky*, edited by Millard Meiss, New York, N.Y. University Press, 1961, vol. 1, pp. 98–120, and vol. 2, figs. 1–19 on pls. 27–35.

———. The iconography of a Kāshān luster plate. (Co-author, Grace D. Guest.) *Ars Orientalis*, vol. 4 (1961), pp. 25–64, 74 figs. on 22 pls.

———. The Illuminations in the Cairo Mosche-b. Asher-Codex of the Prophets . . ., by R. H. Pinder Wilson with contributions by R. Ettinghausen. *Der Herbäische Bibeltext Seit Franz Delitzsch*, by Paul Kahle. Stuttgart, W. Kohlhammer Verlag, 1961, pp. 95–98.

———. Paintings of the sultans and emperors of India in American collections. Bombay, Lalit Kalā Akademi, 1961, 19 pp. 14 col. pls.

———. Taklīf (inlay). *Urdu encyclopedia of Islam*, Lahore, 1960, vol. 1, pp. 597–607, 4 pls.

———. Review of "The Chester Beatty Library: A catalogue of the Persian manuscripts and miniatures, vol. 1, MSS. 101–105," by A. J. Arberry, M. Minovi, and E. Blochet. *Ars Orientalis*, vol. 4 (1961), pp. 393–396.

———. Review of "The Chester Beatty Library: A catalogue of the Turkish manuscripts and miniatures," by V. Minorsky. *Ars Orientalis*, vol. 4 (1961), pp. 385–392.

———. Review of "Indian painting: Fifteen color plates," by W. G. Archer. *Ars Orientalis*, vol. 4 (1961), pp. 397–399, pls. 1–2.

———. Review of "The Nala-Damayantī drawings," by Alvan Clark Eastman. *Ars Orientalis*, vol. 4 (1961), pp. 396–397.

———. Review of "Persian miniatures; the story of Rustum." Introduction and notes by William Lillys. *Artibus Asiae*, vol. 22 (1959), p. 268.

———. Review of "Turkisches Puppentheater. Versuch einer Geschichte des Puppentheaters im Morgenland," by Otto Spies. *The Muslim World*, vol. 50, No. 3 (July 1960).

GETTENS, RUTHERFORD J. European conservation laboratories. *Museum News*, vol. 39 (Dec. 1960–Jan. 1961), pp. 23–27, ills.

———. Teaching and research in art conservation. *Science*, vol. 133 (Apr. 21, 1961), pp. 1212–1216, 3 ills.

KATSUKI, TAKASHI. Review of "The beauty of ceramics," by Seizo Hayashiya. Tokyo, Kawade Shobo, 1960. *Far Eastern Ceramics Bulletin*, vol. 12, No. 43 (June–Dec. 1960), p. 47.

———. Review of "Chinese ceramics, one hundred selected masterpieces from collections in Japan, England, France and America," ed. by Fujio Koyama. Tokyo, Nihon Keizai, 1960. *Far Eastern Ceramic Bulletin*, vol. 12, No. 43, (June–Dec. 1960), p. 48–49.

———. Translation of "Chōsen tōji gaisetsu," or general observations on Korean ceramics, by Fujio Koyama. *Far Eastern Ceramic Bulletin*, vol. 12, No. 43 (June–Dec. 1960), pp. 19–38, 6 pls.

POPE, JOHN ALEXANDER. Chinese art treasures, exhibited in the United States by the Government of the Republic of China, Washington, 1961, 286 pp., pls. (part col. and mount.) Text by John A. Pope, Aschwin Lippe, and James F. Cahill.

———. Chinese art treasures cross the Pacific. *The Connoisseur*, New York, vol. 147 (June 1961), pp. 231–240, col. front., 20 figs.

———. Review of "Dated Buddha images of Northern Siam," by A. B. Griswold. *Ars Orientalis*, vol. 4 (1961), pp. 446–452.

STERN, HAROLD P. America; a view from the East. *Antiques*, vol. 79 (Feb. 19, 1961), pp. 166–169, ills.

———. A ninth-century eleven-headed Kannon. *Worcester Art Museum Annual*, vol. 8 (1960), pp. 1–7, front., 4 pls.

———. Obituary, James Marshall Plumer. *Oriental Art*, n.s., vol. 7 (spring 1961), p. 47.

———. Review of "Hokusai," by J. Hillier. London, Phaidon Press, 1955. *Journal of Asian Studies*, vol. 19 (Nov. 1959), pp. 87–88.

———. Review of "Graphic art of Japan, the Classical school," by Owen E. Holloway. Hollywood-by-the-Sea, Florida, Translantic Arts, 1957. *The Art Bulletin*, vol. 42 (Dec. 1960), pp. 311–312.

PHOTOGRAPHIC LABORATORY

The photographic laboratory made 10,378 items during the year, as follows: 7,363 prints, 864 negatives, 2,013 color slides, 100 black-and-white slides, 38 color-film sheets. In all, 3,133 slides were lent during the year.

BUILDING AND GROUNDS

The exterior walls appear to be sound and in good condition, but plans are under way for roof repair during the next year.

Painting of structural steel in the attic was begun but not completed. The cleaning of the interior limestone was finished, which improved the general appearance greatly. All concrete floors were painted and given a protective coat of wax.

In storage 14 all stone storage was confined to two walls by refitting with new steel and wood shelving. The remaining area will be fitted in the near future for the expansion of storage of various art objects plus an examining table. Storage 16A is now under construction to provide more space for storage and a research work area.

The doors leading from the main office to the anteroom were redesigned and fitted with glass. The dais in Gallery V was completely refinished. In the auditorium new drapes and stage curtain were installed. A new projector was installed, and with this second projector and the enlarged screen it is now possible to show two slides side by side for comparison purposes for the lecture series.

Old boxwood plants from the courtyard were transplanted to the north entrance of the building and smaller replacements were made in the court. Lantana was planted around the fountain for the summer season and appears to be doing well.

ATTENDANCE

The Gallery was open to the public from 9 to 4:30 every day except Christmas Day. The total number of visitors to come in the main entrance was 130,949. The highest monthly attendance was in August, 19,576.

There were 2,140 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:

1960	
October 11.	Dr. Nelson I. Wu, Yale University, "In Search of a New Style in Chinese Painting." Attendance, 155.
November 15.	Dr. John D. Cooney, Brooklyn Museum, "Disasters in Collecting." Attendance, 142.
1961	
January 10.	Dr. Richard Edwards, University of Michigan, "Painting of the Southern Sung." Attendance, 142.
February 14.	Professor Benjamin Rowland, Harvard University, "The Translation of Indian Art to Central Asia." Attendance, 203.
March 14.	Henry Trubner, Royal Ontario Museum, "Han Pictorial Design." Attendance, 113.
April 11.	Professor George H. Forsyth, Jr., University of Michigan, "The Fortified Monastery of St. Catherine at Mt. Sinai." Attendance, 202.

From June 12 to 14 a seminar on "Technical Studies of Ancient Metal Artifacts" was held, the chief purpose of which was to gather together specialists in ancient metals and other interested persons from fields of Chinese art and conservation. Problems in analysis, composition, fabrication, and alteration of ancient metal artifacts were discussed with particular reference to Chinese ceremonial bronzes in the Freer collections. Question periods and informal discussions followed each of the 15 papers read by specialists from the United States, Canada, and one from Australia. Attendance, 57, 44, and 52.

Outside organizations used the auditorium as follows:

The Bellhaven Woman's Club held a short business meeting in the morning.	October 18. Attendance, 40.
The United States Department of Agriculture held meetings as follows:	
Foreign Agriculture	November 14. Attendance, 198. May 22. Attendance, 499.
Federal Extension Service	November 16. Attendance, 290. March 20. Attendance, 131.
Food and Drug Administration	November 23. Attendance, 95. December 21. Attendance, 68. February 15. Attendance, 76. March 15. Attendance, 63. April 19. Attendance, 101. May 17. Attendance, 89. June 21. Attendance, 72.
Marketing Division, Economic Research Conference	November 28–30. Attendance, 150, 195, and 109. December 2. Attendance, 85.
Farmers' Co-op Service	December 13 and 15. Attendance, 115, and 119.
4–H Clubs	March 23. Attendance, 176.

The Washington Film Society showed the following films:	
"The Story of Gosta Berling" (1923) Sweden.	April 6 and 7. Attendance, 254.
"Los Olivadados" (1951) Mexico.	April 13 and 14. Attendance, 168.
"Munna" (1957) India, and "Song of Ceylon" Great Britain (1934).	April 20 and 21. Attendance, 313.
"Where Chimneys are Seen" (1953) Japan, and "Fable for Friendship."	April 27 and 28. Attendance, 211.
"Farrebizue" (1947) France, and "Trut" (1944) Sweden.	May 4 and 5. Attendance, 194.
Three short films from the British Free Cinema.	May 11 and 12. Attendance, 209.
"The White Reindeer" (1956) Finland, and "Glimmering" (1948) France.	May 25 and 26. Attendance, 168.
"Goja" (1951) Tunisia, and "Time Out of War" (1955) France.	June 1 and 2. Attendance, 154.
"Bab El-hadid" (1959) Egypt, and "N.Y., N.Y." (1950) United States.	June 8 and 9. Attendance, 275.
Alfred Friendly, of the Washington Post, lectured on "Bushmen (African) Paintings."	May 10. Attendance, 170.
Washington Society of the Archaeological Institute of America showed three films: "Roman Mosaics," "Colors in the Dark," and "Book Festivities."	May 18. Attendance, 229.

On May 2, seven members of the Washington Society of the Archaeological Institute of America held a Board Meeting in the Staff Room, Dr. Ettinghausen, president, presiding.

STAFF ACTIVITIES

The work of the staff members has been devoted to the study of new accessions, objects contemplated for purchase, and objects submitted for examination, as well as to individual research projects in the fields represented by the collections of Chinese, Japanese, Persian, Arabic, and Indian materials. Reports, oral and written, and exclusive of those made by the technical laboratory (listed below), were made on 7,221 objects as follows: For private individuals, 5,438; for dealers, 874; for other museums, 909. In all 1,373 photographs were examined, and 780 Oriental language inscriptions were translated for outside individuals and institutions. By request, 23 groups totaling 550 persons met in the exhibition galleries for docent service by the staff members. Two groups totaling 24 persons were given docent service by staff members in the storage rooms.

Among the visitors were 64 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 carried on the following activities:

Objects examined by various methods including microscopic, microchemical, X-ray diffraction, ultraviolet light, spectrochemical analysis, and specific gravity determination:

Freer objects examined	19
Outside objects examined	93

The following projects were undertaken by the laboratory during the year:

1. For a period of three weeks, February 24 to March 15, Miss Elisabeth West worked as a guest in the Conservation Center of the Institute of Fine Arts, New York University, where she continued the spectrochemical analyses of inscribed ceremonial bronzes from the Freer collections.

2. In April 1961, R. J. Gettens, at the Conservation Center of the Institute of Fine Arts, New York University, gave a seminar entitled "Use of the Microscope in Examination of Works of Art." Attendance, 8.

3. R. J. Gettens continued as editor and Miss West as assistant editor of *IIC Abstracts* published by the International Institute for Conservation of Historic and Artistic Works, London, England.

4. Continued systematic collection of data on the technology of ancient copper and bronze in the Far East.

By invitation the following lectures were given outside the Gallery by staff members (illustrated unless otherwise noted):

1960	
August 11.	Dr. Ettinghausen, at the Twenty-fifth International Congress of Orientalists, Moscow, U.S.S.R., "Pre-Mughal-Indo-Muslim Manuscripts."
September 15.	Dr. Ettinghausen, at the American School of Oriental Research, Jerusalem, Israel, "The Interrelationship of India and the Near East in the Middle Ages."
October 20.	Dr. Cahill, at Yale University, New Haven, Conn., "The Coming Discovery of Chinese Paintings."
November 1.	Dr. Ettinghausen, at Ankara University, Turkey, "Variety of Arts in Museums of Iran, Pakistan, and Turkey."
November 13.	Dr. Cahill, at Miami University, Oxford, Ohio, "The Coming Discovery of Chinese Paintings."
November 14.	Dr. Cahill, at Miami University, Oxford, Ohio, "Great Chinese Paintings in Far Eastern Collections."
November 17.	Dr. Cahill, at Mary Washington College, Fredericksburg, Va., "In Search of Chinese Paintings."
November 28.	Dr. Cahill, at the Japan-America Society, Washington, D.C., "The Southern School in Japanese Painting."
1961	
January 12.	Dr. Stern, at Regents' Dinner, Smithsonian Institution, Washington, D.C., "Hokusai."

January 19.	Dr. Ettinghausen, at Hermitage Foundation, Norfolk, Va., "Islamic Art in the Mediterranean World."
February 3.	Dr. Ettinghausen began teaching a semester's course on "Islamic Painting" at New York University.
February 6.	Dr. Cahill began an academic course of lectures on Chinese paintings at the American University, Washington, D.C.
February 14–15.	Dr. Ettinghausen, at University of Southern Illinois, Carbondale, Ill., "Mughal Painting: A Critical Comparison."
February 23.	Dr. Stern, at the University of Michigan, Ann Arbor, Mich., "Japanese Paintings of the Tokugawa Period."
February 24.	Dr. Cahill, at the Institute of Contemporary Arts, Washington, D.C., "Chinese Art and the Contemporary West."
March 10.	Dr. Ettinghausen, at the Foreign Service Institute, Washington, D.C., "Islamic Art."
March 16.	Dr. Cahill, at Walters Art Gallery, Baltimore, Md., "Great Chinese Paintings in Far Eastern Collections."
March 24.	Dr. Ettinghausen, at Macalester College, St. Paul, Minn., "Islamic Art."
March 30.	Dr. Cahill, at the Chinese Art Society, Asia House, New York City, "Chinese Art and the Contemporary West."
April 3.	Dr. Pope, at the Far Eastern Luncheon Association, Carlton Hotel, Washington, D.C., "The Chinese Exhibition." (Not illustrated.)
April 12.	Dr. Stern, at the Birmingham Museum of Art, Birmingham, Ala., "Japanese Painting of the Tokugawa Period."
April 15.	R. J. Gettens, at the Conservation Center, Institute of Fine Arts, New York University, "A Proposed Handbook for Analysis of Materials of Art and Archaeology."
May 23.	R. J. Gettens, at the American Association of Museums meeting, Detroit, Mich., "Maya Blue: An Unsolved Problem in Ancient Pigment."
May 23.	Elisabeth West, at the American Association of Museums meeting, Detroit, Mich., "Efflorescent Salts on Museum Objects."
June 6–11.	Dr. Cahill, at the National Gallery of Art, Washington, D.C., gave seven lectures on "The Chinese Exhibition."

Members of the staff traveled outside Washington on official business as follows:

1960

July 1.	Dr. Stern, in New York City, examined objects at dealers and in museums and private collections.
July 18–December 16.	Dr. Ettinghausen attended the 25th International Congress of Orientalists in Moscow on behalf of the Smithsonian Institution and the American Council of Learned Societies, as well as the Cultural Seminar on Art and Archaeology of the CENTO Powers, in Ankara, on behalf of the Department of State. He also studied Islamic objects, paintings, and manuscripts in the museums and libraries of Dublin, London, Oxford, Paris, Hamburg, Bukhara, Kabul, Teheran, Damascus, Jerusalem, Qusair, 'Amra, Cairo, Istanbul, Ankara, Konya, Bursa, Vienna, Milan, Florence, Bologna, Rome, Palermo, and Madrid.

September 7–14.	Dr. Stern, in New York City, examined objects at dealers and in museums and attended exhibitions at the Museum of Modern Art and the Metropolitan Museum.
September 8–23.	Elisabeth H. West spent two weeks in England visiting laboratories and conferring with members of various staffs in London: Research Laboratory; British Museum; National Gallery of Art; Victoria and Albert Museum; Institute of Archaeology; Courtauld Institute of Art; University of London; and the Percival David Foundation of Chinese Art. Oxford: Research Laboratory for Archaeology and the History of Art.
October 22.	Dr. Cahill, in New York City, examined Chinese paintings belonging to dealers and museums, and attended an exhibition of Chinese paintings at Asia House.
November 5.	Dr. Cahill, in New York City, examined Chinese paintings belonging to a private collector.
December 14–18.	Dr. Stern and T. Sugiura, in New York City, attended an official meeting of the Rockefeller Foundation; attended the opening of the Modern Japanese Craft Show at the Museum of Decorative Arts; an exhibition of Japanese screens at the Willard Gallery; the Rappert exhibition at Asia House; and examined objects.
1961	
January 6.	Dr. Ettinghausen, in New York City, examined objects.
January 9–10.	Dr. Pope, in Boston, attended the final meeting of the Far Eastern Ceramic Group.
January 19.	Dr. Ettinghausen, in New York City, examined objects at dealers.
January 23.	Mr. Gettens, in New York City, attended meetings of the Conservation Committee at the Institute of Fine Arts, New York University.
January 26.	Dr. Cahill, in New York City, broadcast over THE VOICE OF UNESCO, Riverside Radio program WRVR, on "Books and the Artist."
February 17.	Dr. Ettinghausen, in New York City, examined objects.
February 17–March 20.	Dr. Pope, in Geneva, Switzerland, for consultations regarding printing of the catalogue for the Chinese Exhibition.
February 21–April 10.	Dr. Stern, in Chicago, Seattle, San Francisco, Santa Barbara, Los Angeles, Kansas City, and Cleveland, examined objects in museums, private collections and at dealers.
March 29–April 1.	Dr. Cahill, in New York City, examined objects.
April 22.	Dr. Cahill, in Chicago, examined objects.
April 28–May 2.	Dr. Pope, in Chicago, examined objects.
May 4, 5.	Mrs. Lnor O. West, in the Boston area, attended the meetings of the Museum Store Managers Association held in the Museum of Fine Arts, Worcester Art Museum, and Old Sturbridge Village.
May 12–16.	Dr. Pope, in Philadelphia, appeared on the University Museum's WCAU–TV program, WHAT IN THE WORLD, later going on to New York City to examine objects.

May 18–24. Dr. Stern, in Philadelphia, examined objects at the Philadelphia Museum of Art, and later, in New York City.

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.

A. G. Wenley, *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, 1961:

Administrative studies and planning continued for the new National Air Museum Building, pending the appropriation of planning funds.

Many interesting and historically significant accessions were received during the year. Among the more notable ones were a full-size mock-up of an inertial guidance platform used for navigation in space-flight vehicles, from the Autonetics Division of North American Aviation, Inc.; an early Curtiss-built OX–5 aircraft engine, from the Massachusetts Institute of Technology; the RVX 1–5, first recovered nose cone after a flight of intercontinental range, from the U.S. Air Force; three additional volumes of Dr. Robert Goddard's notes on his experiments, from Mrs. Goddard; the XF8U–1 "Crusader" airplane (the "One X"), from Chance Vought Aircraft Company and the U.S. Navy; the Hiller "Flying Platform," from the U.S. Army and Navy; memorabilia of Norman Prince of the Lafayette Escadrille, from Frederick H. Prince, Jr.; Discoverer XIII, first recovered orbiting satellite, from the U.S. Air Force; the "Que Sera Sera," first airplane to land at the South Pole, from the U.S. Navy; 150 volumes of Pilots and Engine Manuals, from the Shell Companies Foundation; the first camera to take stabilized motion pictures of the earth from space, from the General Electric Company; the radio transmitter used by Adm. Richard E. Byrd in his historic first flight over the South Pole; and a painting of astronaut Alan B. Shepard, from Congressman James Fulton.

The name of the old Aircraft Building was changed to the Air and Space Building to reflect the many famous firsts of space flight now exhibited. During the fiscal year, 987,858 visitors to this renovated display were counted. It is expected that the Mercury capsule "Freedom 7" will be placed in this building shortly.

Information service continued to increase during the year. The museum now averages about 400 letters per month, furnishing historical, technical, and biographical information on air and space flight to authors, researchers, schools, government agencies, and the public.

ADVISORY BOARD

No formal meetings of the Advisory Board were held. Individual members were consulted from time to time.

SPECIAL EVENTS

The following special presentation ceremonies were held during the year. The RVX 1–5 nose cone, presented by Gen. Bernard A. Schriever, USAF; a Beechcraft Executive airplane, presented by George L. Lee, Sr., chairman of the board of the Red Devil Tool Co.; the Able-Baker space flight equipment, presented by Lt. Gen. J. H. Hinrichs, U.S. Army; the XF8U–1 "Crusader," presented by Charles J. McCarthy of Chance-Vought Company and Adm. James S. Russell of the Navy; the Discoverer XIII satellite, presented by Gen. Thomas D. White, Chief of Staff, USAF; and the first space camera, presented by Hilliard W. Page, general manager of the missile and space vehicle department of the General Electric Company.

The Director attended the Air Force Association Annual Meeting in San Francisco at which he was honored with the Alpha Eta Rho Aviation Fraternity Award for contributions to Aviation Education. He also attended the annual meeting of the National Aeronautic Association, the Lester D. Gardner Lecture by Gen. James H. Doolittle at MIT, the dedication of the Paul Moore Research and Development Center at Republic Aviation Corporation, and visited numerous Army, Navy, Air Force, and NASA bases. He spoke frequently on these visits, emphasizing the importance of the proper preservation and recording of the history of space flight now being made.

Paul E. Garber, head curator and historian, and curators Louis S. Casey and Kenneth E. Newland represented the air museum at a number of aviation meetings during the year. Mr. Garber delivered 27 lectures.

IMPROVEMENTS IN EXHIBITS

There have been continuous experimentation and improvements in the Museum's exhibits, reflected particularly in the renovated Air and Space Building which has proved to be a valuable testing ground for new methods of display, in anticipation of the new building.

REPAIR, PRESERVATION, AND RESTORATION

Continued improvement in the facilities at the Silver Hill, Md., restoration and preservation division has been accomplished. This is now a busy little aircraft "factory," made out of storage space, preserving and restoring aircraft and engines for display in the new building. Examples of the work done are found in the Air and Space Building.

ASSISTANCE TO GOVERNMENT DEPARTMENTS

Service and information was provided during the year to various Government departments including the Federal Aviation Agency, National Aeronautics and Space Administration, Justice Department, U.S. Navy, U.S. Air Force, Post Office Department, and Bureau of Standards.

PUBLIC INFORMATION SERVICE

This service grows in volume, and requires the majority of the time of the curatorial staff. The historical research involved is valuable not only to the the authors, researchers, historians, students and teachers served, but also to the Museum staff as potential material for eventual Museum publications.

REFERENCE MATERIAL AND ACKNOWLEDGMENTS

Much useful material was added to the reference files, library, and photographic files of the Museum during the year. This is very valuable to the staff for providing information, authenticating data, and for historical research.

The cooperation of the following persons and organizations in providing this material is sincerely appreciated and acknowledged:

Air Force Logistic Command, Wright-Patterson Air Force Base, Ohio: Two copies of the Index of Serial Numbers assigned to aircraft through fiscal year 1958.

Aitken, William D., Jacksonville Beach, Fla.: One photostat of page 2 of the Boston Herald, Dec. 5, 1909, magazine section and three photographs.

Amos, Vincent S., St. Petersburg Beach, Fla.: 20 volumes aviation periodicals.

Ando, Hideyo, Tokyo, Japan: Nine 4-x-5'' photographs of Japanese aircraft.

Army Ballistic Missile Agency, Redstone Arsenal, Huntsville, Ala.: 16-mm. sound motion picture of "Recovery of Able-Baker Nose Cone," edited copy of ABMA-film No. 89, copy 3 unclassified.

Arnold, Mrs. H. H., Sonoma, Calif.: A group of 36 photographs.

Backard, P. H., Lockheed Aircraft Service Inc., Ontario, Calif.: Book, "The Flying Flea," by Henri Mignet.

Bell Aerosystems Co., Buffalo, N.Y.: Motion picture, "Report on Jet Propulsion."

Boeing Airplane Co., Seattle, Wash.: Photographs, several lithographed 3-view drawings of aircraft (Boeing).

Brockhampton Press, Leicester, England: Book, "Hovercraft," by Angela Croome,

Brown, W. Norman, Toronto, Canada: Five 4½-x-6'' photographs.

Buckley, Mrs. W. W., Washington, D.C.: One 16-x-20'' photograph of a Farman airplane taking off from street between White House and State, War, and Navy Building.

Cannon, James, Office of Public Information, U.S. Atomic Energy Commission, Washington, D.C.: Two photographs of atomic bombs (WWII).

Coleman, "Cole," New Orleans, La.: One 12-x-15½'' photograph of Lindbergh.

Cox, Jere, Braniff Airways, Dallas, Texas: 19 8-x-10'' photographs (14 of Braniff type of aircraft and 5 of presentation ceremonies and T. E. Braniff); organization chart; chart showing Braniff routes; also four fact sheets.

Douglas Aircraft Co., Inc., Santa Monica, Calif.: Two sets of drawings of Douglas "World Cruisers."

Downer Aircraft Industries, Inc., Alexandria, Minn.: Photographs, miscellaneous data on Bellanca 260.

Early Bird Organization, E. A. Goff, Jr.: Early Bird files.

Fairchild Engineering and Aircraft Corp., Hagerstown, Md.: Specifications of the Fairchild F27 and F27A.

FRAZAR, MRS. PEARL, San Diego, Calif.: Program of the International Air Meet at Grant Park, Chicago, Aug. 12–20, 1911.

GEUTING, JOSEPH T., Washington, D.C.: Copy of "The 1961 Aerospace Year Book."

GIBSON, CHRISTIAN D., RAYMOND CORP., Greene, N.Y.: 16 issues of Industrial Aviation magazine, May 1944–August 1945.

GLENBOW FOUNDATION, Calgary, Alberta, Canada: Eight 8-x-10'' photographs, 14 5-x-7'' photographs, all of JL–6 type of aircraft.

GODDARD, MRS. ROBERT H., Worcester, Mass.: 1929 transcription of the material in Vols. 1 and 2 of set of 20 volumes. Report on the development of liquid-propelled rocket. Consists of 8 sections (337 pages) of transcript, and 8 reports of August 1929, containing 398 2¾-x-4¾'' photographs.

GREESON, OTIS H., Washington, D.C.: 13 photographs of miscellaneous aircraft and shows.

HAGERT, HENRY, Moorestown, N.J.: 28 copies of "Aero and Hydro" magazine from December 1912 to July 1913.

HAWKS, CHARLES R., FEDERAL AVIATION AGENCY, Los Angeles, Calif.: 39 boxes of engineering data on obsolete aircraft.

HOFFMAN, MAJ. WM. WECKHAN, New York, N.Y.: One photo album; three artillery School Manuals, WWI; one pictorial, "Belgium at War"; one translation of the campaign of the Belgium Army.

INTERNATIONAL CIVIL AVIATION AGENCY, Montreal, Canada: 16-mm. films, "Approach to Land GCA" and "Approach to Land ILS."

JOHNSON, F. ROY, Murfreesboro, N.C.: Copies of two old prints of Henry Gatling's pre-Civil War gliders.

KNABENSHUE, MRS. H. ROY, Arcadia, Calif.: Books, photographs, photo albums, magazines, newspaper clippings, airship log books, maps, drawings.

KORN, EDWARD A., East Orange, N.J.: Three photographs.

LIBRARY OF CONGRESS, Nathan R. Einhorn, Washington, D.C.: Miscellaneous.

LOCKHEED AIRCRAFT INTERNATIONAL, INC., Los Angeles, Calif.: Brochure containing news releases, photographs, and general information on Lockheed LASA–60 aircraft.

MARTIN CO., Baltimore, Md.: Drawings and photographs of Martin aircraft. Picture history of the Martin Co. with 3-view drawings.

MASSIN, ALEX, Toronto, Ontario, Canada: 16 commemorative air mail envelopes.

MAYERMAN, SAMUEL, Philadelphia, Pa.: Four bound volumes of "American Aviation."

MCGUINN, CAPT. MICHAEL E. III, New York, N.Y.: Drawing of 1906 and 1909 Ellehamer plane, magazines and clippings on Ellehamer.

MEAD, MRS. CLARENCE, Seattle, Wash.: Five photographs of Post-Rogers crash scene.

MEYER, CORD, New York, N.Y.: Identification card of Lt. A. B. Thaw, II.

MOLSON, KEN M., Islinzton, Ontario, Canada: Book by Alan Sullivan, Lt. RAF, "Aviation in Canada, 1917–1918."

MYERS, FRANK A., Cleveland, Ohio: 20 pages of photostats of 1910–11 Harvard Boston Aero Meets as reported in *The Boston Evening Transcript*, September 1910, August and September 1911.

NAVY, DEPARTMENT OF THE, BUREAU OF AERONAUTICS, Washington, D.C.: 53 photograph albums.

NOORDUYN, ROBERT H., Irving, Texas: One photograph of Fokker T–2, one booklet of Fokker aircraft.

NORTHWEST AIRLINES, INC., Ronald McVickar, Washington, D.C.: History, photographs of their airlines and two annual reports, 1958 and 1959.

PAGE, GEORGE A., and PURDUM, VERNON, AERONCA MANUFACTURING CORP., Middletown, Ohio: 36 drawings of Aeronca aircraft, E113A installation drawing, low wing data report, production quantity listing (1930–44) miscellaneous performance data sheets (2).

PAGE, GEORGE, JR., Reynoldsburg, Ohio: National Geographic Magazine, 1918–46, including photographs, negatives, blueprints (Curtiss). News clipping of Ballooning.

PARKER, FRED: One photograph scrapbook, two photographs, one book.

POLITELLA, DARIO: Book, "Operation Grasshopper."

RESEARCH STUDIES INSTITUTE, Maxwell AFB, Ala.: Documents on the B–29 "Enola Gay" and organization.

REYNOLDS, B. C., Santa Barbara, Calif.: Roland Rohlf's chronology. Four transcripts of personal interviews.

RUSSELL, FRANK F., New York N.Y.: Three photograph albums and assorted photographs.

SEBOLD, R. C., GENERAL DYNAMICS CORP., San Diego, Calif.: Two sets of 3-view drawings, 1:16 scale of Convair F2Y–1 and Convair XFY–1 airplanes.

SHIPMAN, ERNEST, INTERNATIONAL BUSINESS MACHINES CORP., New York, N.Y.: Photographs, photo album, correspondence, pamphlets, Hammer collection.

SIKORSKY AIRCRAFT, Stratford, Conn.: Photographs and reference material on the Sikorsky S–61 and HSS–2 helicopters.

STRICKLAND, MRS. P. O'MALLEY, FEDERAL AVIATION AGENCY, Washington, D.C.: Copy of "Leslie Takes the Skyroad."

VERNON, VICTOR, St. Petersburg, Fla.: Two scrapbooks.

VICTORY, DR. JOHN F., Washington, D.C.: Bound book "L'Aeronautica Italiana Nell 'Immagine, 1487–1875."

WEBSTER, CLIFFORD L., West Palm Beach, Fla.: 135 photographs and 5 flight log books.

WEEKS, MRS. HAROLD E., Brooklyn, N.Y.: Book of bound copies of *The Weekly Bulletin* of the School of Instruction, Army Balloon School, Arcadia, Calif., dated 1918 through 1919.

WENTZEL, VOLKMAR, NATIONAL GEOGRAPHIC SOCIETY, Washington, D.C.: Photograph of early airship.

WILLIAMS, COL. DAVID M., Alexandria, Va.: Photo copy of diary.

ACCESSIONS

Additions to the National Aeronautical and Space collections received and recorded during the fiscal year 1961 totaled 266 specimens in 110 separate accessions, as listed below. Those from Government departments are entered as transfers; others were received as gifts or loans.

AERONCA MANUFACTURING CORP., Middletown, Ohio: An Aeronca E–113 engine cut-away. (N.A.M. 1176.)

AIR FORCE, DEPARTMENT OF THE, Wright Patterson Air Force Base, Ohio: Four aircraft engines of World War I period. (N.A.M. 1213.) Ballistic Missile Division, Calif.: Capsule that contained the measuring and recording instruments during the Discoverer XIII experiment. (N.A.M. 1183.) Through Marquardt Aircraft Company, Ogden, Utah: A Marquardt YRJ–43–MA–3 ram-jet engine, serial No. 00001, embodying the latest developments in the ram-jet propulsion system. (N.A.M. 1184A.) Air Force Museum, Fairborn, Ohio: A Russian Yakovlev 18 (YAK–18), post-World War II advanced trainer and nuisance raider. (N.A.M. 1153.) Air Research and Development Com-

mand, Dayton, Ohio: RVX 1–5, the first nose cone recovered after a flight of intercontinental range. (N.A.M. 1159.)

AMERICAN MACHINE & FOUNDRY Co., Springdale, Conn.: Model of a ground-effect machine developed by Walter Crowley. (N.A.M. 1233.)

ARMY, DEPARTMENT OF THE, ARMY BALLISTIC MISSILE AGENCY, Huntsville, Ala.: Exact duplicate mockup of monkey Baker space capsule covered with lucite walls (N.A.M. 1173); Able-Baker Project recovered nose cone (N.A.M. 1164); two Explorer I satellites (first U.S. satellite in orbit) and two final-stage power packs (N.A.M. 1163). ARMY ORDNANCE MISSILE COMMAND, Redstone Arsenal, Ala.: 12 varied-scale models of Army missiles and launch vehicles. (N.A.M. 1175.) ARMY EXHIBITS, Cameron Station, Va.: 1:24 scale model of Jupiter C with Explorer I satellite mounted on it. (N.A.M. 1151.)

ARNOLD, Mrs. H. H., Sonoma, Calif.: Memorabilia of Gen. H. H. Arnold, including his personal flags of rank, dress uniform worn at his wedding, and eight academic hoods for the various honorary degrees he received (N.A.M. 1246); duty uniform of Gen. Arnold. (N.A.M. 1149).

AUSMUS, REINHARDT, Sandusky, Ohio: Two early aircraft propellers. (N.A.M. 1236.)

AUTONETICS DIVISION, NORTH AMERICAN AVIATION, INC., Downey, Calif.: Full-size mockup of inertial guidance platform used for navigation in nuclear submarines and space vehicles. (N.A.M. 1146.)

AVIATION GAS TURBINE DIVISION, WESTINGHOUSE ELECTRIC, Kansas City, Mo.: Westinghouse J–32 gas turbine engine produced in 1943–44 and the smallest of this type of engine produced, developing 300 lbs. thrust at 35,000 rpm. (N.A.M. 1180.)

AZBE, VICTOR J., St. Louis, Mo.: Original letter written by Otto Lillienthal to his brother Gustav, Oct. 25, 1886. (N.A.M. 1152.)

BATES, MORTIMER F., Burbank, Calif.: 1912 aviator's helmet purchased from Roold in Paris in 1912. (N.A.M. 1182.)

BEECH AIRCRAFT CORP., Wichita, Kans.: Model of the Beech AT–7, a World War II twin-engine advance pilot training aircraft. (N.A.M. 1230.)

CAIN, CHARLES W., Milwaukee, Wis.: An ashtray of aluminum from the tank of the Bellanca airplane "Columbia" which twice flew across the Atlantic Ocean in 1927 and 1930. (N.A.M. 1154.)

CARMELO, ALFREDO, Bethesda, Md.: Painting of Bevo Howard's Jungmeister aerobatic plane. (N.A.M. 1240.)

CHANCE VOUGHT AIRCRAFT, INC., Dallas Tex.: Model of the Regulus I surface-to-surface missile (N.A.M. 1168); the Chance Vought XF8U–1 "Crusader," popularly known as the "One X" (N.A.M. 1174).

CONVAIR, DIVISION OF GENERAL DYNAMICS, San Diego, Calif.: Two scale models of the Convair Atlas launch vehicle (N.A.M. 1224); 8–x–10′ photo montage mural of the launching of an Atlas (N.A.M.) 1215).

CURTISS-WRIGHT CORP., Woodridge, N.J.: 1:16 scale model of Curtiss A–1 aircraft, the first U.S. Navy aircraft. (N.A.M. 1221.)

DOOLITTLE, GEN. JAMES H., Los Angeles, Calif.: Six items of personal memorabilia: special awards, plaques, etc. (N.A.M. 1145.)

DUPONT, F. V., Cambridge, Va.: Model of the Wright "B" airplane. (N.A.M. 1244.)

FEDERAL AVIATION AGENCY, Oklahoma City, Okla.: Radio equipment. (N.A.M. 1172.)

FULTON, CONGRESSMAN JAMES, Pittsburgh, Pa.: Loan of a painting of Alan Shepard, America's first man-in-space, painted by James Scalese of Pittsburgh. (N.A.M. 1241.)

General Electric, Philadelphia, Pa.: First camera to take pictures of earth from outer space. (N.A.M. 1218.)

Goddard, Mrs. Esther C., Worcester, Mass.: Vols. 21, 22, and 23 of Dr. Goddard's notes on his experiments. (N.A.M. 1165).

Golden, Bernie, Asbury Park, N.J.: A propeller manufactured by the Simmons Co. of Washington, D.C., of a very early vintage. Fitted with sprocket attachment for chain drive. (N.A.M. 1148.)

Grumman Aircraft Corp., Bethpage, N.Y.: Model of the Grumman F1OF Jaguar fighter aircraft. (N.A.M. 1238.)

Hall, Ernest, Warren, Ohio: Fragments of aircraft and engines built by the Wrights, Curtiss, and Bleriot. (N.A.M. 1237.)

Hartman, Arthur J., Burlington, Iowa : Oil painting of early hot-air balloon ascension at a county fair and a full-size cut-off release with model parachute. (N.A.M. 1251.)

Heintz, Ralph M., Los Gatos, Calif.: Antenna weight used on the "Floyd Bennett" during its flight over the South Pole in 1929 (N.A.M. 1232) ; aircraft transmitter used by Richard E. Byrd in his historic first flight over the South Pole (N.A.M. 1223).

Hylan, Ray, Henrietta, N.Y. : Boeing F4B–4 single-engine biplane Navy fighter of the early 1930 period. (N.A.M. 1243.)

Italian Government, Air Attache, Washington, D.C.: Model of a Macchi 202 fighter, the most advanced fighter design produced by Italy in World War II. (N.A.M. 1147.)

Jouett, Col. John, Washington, D.C.: Trophy urn presented to a group of Americans for their service to the Republic of China during World War II. (N.A.M. 1239.)

Klean, Lester E., Bensenville, Ill. : Model of the Curtiss JN4–D–2. (N.A.M. 1166.)

Lockheed Aircraft Corp., Burbank, Calif. : 1 : 16 scale model of the Navy submarine-launched missile, the "Polaris." (N.A.M. 1249.)

Martin Company, Baltimore, Md.: Model of early monoplane patrol bomber (N.A.M. 1225) ; model of the SM68 Titan missile produced by the Martin Company for the U.S. Air Force (N.A.M. 1222).

Massachusetts Institute of Technology, Cambridge, Mass.: Curtiss-built OX–5 engine with manufacturer's number 6329. (N.A.M. 1157.)

Massin, Alex, Toronto, Ontario, Canada: Set of 12 U.S. Air Force insignia, (N.A.M. 1214.)

McDonnell Aircraft Corp., St. Louis, Mo. : 1 : 3 scale model of the Mercury capsule with escape tower (N.A.M. 1231) ; model of the McDonnell F4H–1 Phantom II (N.A.M. 1235) ; 12 1 : 16 scale models of aircraft produced by the donor (N.A.M. 1242).

Mead, Clarence H., Seattle, Wash. : Pontoon flat cap from Post-Rogers plane wreck. (N.A.M. 1167.)

Messerschmitt, A. G., Augsburg (through German Air Attache), Washington, D.C.: Model, 1 : 16 size, of the famed Messerschmitt BF 109 single-seat, single-engine fighter of World War II. (N.A.M. 1162.)

Mikesh, Capt. Robert C., Washington, D.C. : Models of two Japanese fighters. (N.A.M. 1226.)

Miller, L. B., Tarpon Springs, Fla. : Leather flight coat-jacket that belonged to Amelia Earhart. (N.A.M. 1227.)

Modern Art Foundry, New York, N.Y.: Purchase of bronze casting of plaster bust of Dr. S. P. Langley. (N.A.M. 1229.)

National Aeronautics and Space Agency, Washington, D.C. : 14 framed photographs of former members of the National Advisory Committee for Aeronautics (N.A.M. 1161) ; 8-x-10'' piece of skin used in construction of 100'-diameter "Echo" passive communication satellite (N.A.M. 1160).

Navy, Department of the, Washington, D.C.: Production version of Pratt & Whitney J–57 jet engine (N.A.M. 1156). Naval Air Station, Patuxent,, Md.: Hiller Rotorcycle, one-place, portable helicopter (N.A.M. 1245). Exhibits Section, Washington, D.C.: Models of technically and historically significant Navy aircraft (N.A.M. 1234). Office of Naval Research, Washington D.C.: Hiller ducted platform (N.A.M. 1177). Bureau of Weapons, Washington, D.C. Culver TD2C–1 target drone aircraft (N,A.M. 1196) ; Grumman TBF–1 Avenger, U.S. Navy torpedo bomber (N.A.M. 1197) ; Curtiss SB2C–5 "Helldiver" aircraft (N.A.M. 1198) ; Grumman F8F–1D "Bearcat" aircraft, last of the reciprocating-engine carrier-based fighters developed for World War II (N.A.M. 1199) ; first airplane to have landed at the South Pole, "Que Sera Sera," an R4D (N.A.M. 1200) ; Vought V–173 "Flying Pancake" full-size flying model, built to examine the practicability of a low aspect ratio wing configuration (N.A.M. 1201) ; specimen of Japanese attack aircraft developed in anticipation of a "last ditch" defense of the Japanese homeland (N.A.M. 1202) ; Grumman F4F (FM–1) manufactured by Eastern Aircraft (N.A.M. 1203) ; North American SNJ–4 (AF AT–6), advanced trainer used by both the U.S. Navy and the U.S. Army Air Force during World War II (N.A.M. 1204) ; Vought F4U–1B "Corsair," single-engine, single-place, inverted-gull-wing fighter of World War II (N,A.M. 1205) ; Ryan FR–1 "Fireball," single-place twin-engine low-wing aircraft (N.A.M. 1206) ; specimen of the Kaman K–225 helicopter, the first such vehicle powered by a gas turbine engine (N.A.M. 1207) ; Piasecki PV–3 tandem-rotor helicopter, designed as a medium-range rescue and cargo vehicle (N.A.M. 1208) ; Arado Ar–196A, twin float reconnaisance monoplane used on the German battleship "Prince Eugene" (N.A.M. 1209) ; Dornier Do–335 "Pfiel (Arrow)" twin-tandem-engined heavy fighter, developed by the German Air Force about 1942 (N.A.M. 1210) ; an example of the Vought OS2U–3 scout observation type aircraft (N.A.M. 1186) ; Grumman F6F–3 single-engine, single-place, low-wing monoplane fighter of World War II vintage (N.A.M. 1187) ; Douglas D–558–2 "Skyrocket," rocket-powered research aircraft, first to exceed twice the speed of sound (N.A.M. 1188) ; Douglas SBD–6, of a type used extensively in the Pacific theater of operations during World War II (N.A.M. 1189) ; Interstate TDR–1 twin-engine, low-wing monoplane, designed as a remote-control torpedo launching vehicle (N.A.M. 1190) ; Naval Aircraft Factory N3N–3, single-engine two-place biplane trainer of World War II vintage (N.A.M. 1191) ; Sikorsky JRS–1 amphibian aircraft (N.A.M. 1192) ; Boeing (Stearman) N2S–5 Kaydet, two-place, biplane, primary training aircraft (N.A.M. 1193) ; Grumman JRF–2 "Petulant Porpoise" modified to take different experimental hull configurations (N.A.M. 1193) ; Hiller HOE–1 ram-jet-powered helicopter (N.A.M. 1195) ; Navy-Curtiss TS–1 (TR–1), single-place biplane fighter-trainer of 1922 vintage (N.A.M. 1219) ; components of Navy-Curtiss NC–4, the first airplane to cross the Atlantic Ocean (N.A.M. 1220) ; group of 34 exhibition models of varying scale of Navy aircraft types (N.A.M. 1253).

Packard, Patrick H., Ontario, Calif.: Airplane designed by M. Henri Mignet, the first of this design built in the United States at the direction of Powell Crosley. (N.A.M. 1158.)

Palen, Cole, Rhinebeck, N.Y.: Seven early aircraft instruments, mostly of World War I vintage. (N.A.M. 1179.)

Piper Aircraft Corp., Lock Haven, Pa.: Models 1:16 size of the Piper Apache PA–23, Aztec PA–23–50, and the Comanche PA–24 aircraft. (N.A.M. 1217.)

Prince, Frederich H., Jr., Long Island, N.Y.: Memorabilia of Norman Prince. (N.A.M. 1181.)

Red Devil Tools, Union N.J.: Beechcraft Model D–18–S, an example of an executive transport. (N.A.M. 1171.)

Rickenbacker, Capt. E. V., New York, N.Y.: A German World War I flyer's crash helmet and a log book showing flight operations of the 94th Squadron (Rickenbacker's). (N.A.M. 1247.)

Rockwell, Col. Paul, Asheville, N.C.: Bronze reproduction of gold medal struck to commemorate the launching of the French aircraft carrier "LaFayette." (N.A.M. 1248.)

Ryan Aeronautical Corp., San Diego, Calif.: Two 1:20 scale models of Ryan-developed aircraft, the FR–1 "Fireball" and the X–13 "Vertijet." (N.A.M. 1155.)

Shaffer, Cleve F., San Francisco, Calif.: Experimental liquid-fuel rocket motor and spring scale for measuring thrust, used by donor during period 1927 to 1932. (N.A.M. 1252.)

Shell Companies Foundation, Inc., Washington, D.C.: Handbooks, erection and maintenance manuals for aircraft and engines. (N.A.M. 1212.)

Shoemaker, Jos., Estate of, Bridgeton, N.J.: Two aircraft of 1909–11 vintage. (N.A.M. 1211.)

Smithsonian Institution, Secretary's Office, Washington, D.C.: Two guilded metal copies of the Langley Medal which was awarded to Dr. Robert Hutchings Goddard posthumously, June 28, 1960. (N.A.M. 1178.); Department of Arts and Manufactures: Three examples of airplane tail-wheel tires produced by the B. F. Goodrich Company. (N.A.M. 1185.)

Todd, H. S., Miami Springs, Fla.: A unique 5-cylinder, radial model aircraft engine, complete with accessories and a 3-blade adjustable-pitch propeller. (N.A.M. 1150.)

Tracy, Daniel, Lakewood, Ohio: Model 1:16 size of the Curtiss R–6 racer, winner of the 1922 Pulitzer Prize Race. (N.A.M. 1216.)

United Control Corp., Seattle, Wash.: Aircraft warning tone generator for Cessna 210. (N.A.M. 1170.)

Walker, L. L., Jr., Houston, Tex.: A group of 10 historically and technically significant engines (N.A.M. 1250); wooden timing disk for a Hispano-Suiza engine. (N.A.M. 1184.)

Waterman, Waldo, San Diego, Calif.: The Waterman Aerobile, a unique example of the airplane-automobile combination. (N.A.M. 1228.)

Wright, Orville, Estate of, Dayton, Ohio: The original Wright Brothers' aeroplane, invented and built by Wilbur and Orville Wright, and flown by them at Kitty Hawk, N.C., December 17, 1903. (N.A.M. 1169.)

Respectfully submitted.

Philip S. Hopkins, *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 activities of the National Zoological Park for the fiscal year ended June 30, 1961:

GIFTS

From the standpoint of both popular interest and rarity, the outstanding gift of the year was the white tigress, Mohini of Rewa, which arrived on December 4, 1960. This beautiful animal, cream colored with brown to black stripes and ice-blue eyes, was the gift of the Metropolitan Broadcasting Corporation of New York and Ralph Scott of Washington, D.C. The Director of the National Zoological Park, accompanied by Bert Barker, senior keeper of small mammals, flew to India to select the tiger from a litter of four white cubs raised by the Maharajah of Rewa and escort it to Washington. Thomas J. Abercrombie, staff member of the National Geographic Magazine, joined the Zoo men in Rewa to make photographs. The Maharajah had captured a male white tiger cub in 1951, and when it was adult mated it to a normal-colored Bengal tiger. The young were all the usual orange color. Then he mated the white male to one of the female offspring, and the resulting four cubs were all white. A subsequent litter, from the same parents, had one orange and two white cubs. Mohini was formally presented to President Eisenhower on the White House lawn by John Kluge, president of the Board of the Metropolitan Broadcasting Corporation, as a gift to the children of America. Mohini, when she arrived, was a little over 2 years old and weighed about 200 pounds. Her name is Hindi for Enchantress, and she continues to enchant the throngs who daily come to see her. She is the only white tiger in any zoo in the world at this time.

Through the efforts of Mrs. Ira J. Heller, the "Share Your Birthday Foundation"—an organization to promote international good will among children—brought an Indian elephant as a gift from the children of India and the Maharajah of Mysore to the children of America. Ambika is a female approximately 9 years old and weighs 2,820 pounds. She arrived in the United States on April 14, 1961, after a 47-day voyage on the S.S. *Steel Architect* of the Isthmian Line. Between various appearances before school children in other cities she is on deposit in the National Zoological Park, which will eventually be her permanent home.

The Montana State Fish and Game Department, of Helena, Mont., sent to the Zoo five bighorn sheep and one Rocky Mountain goat, thus helping to build up the collection of North American game animals.

The Department of External Affairs, Canadian Government, Ottawa, gave a pair of Canadian beavers. On May 31 they were formally presented by the Speaker of the Canadian Senate, Mark Drouin, and the Speaker of the Canadian House, Roland Michener, and accepted on behalf of the Smithsonian Institution by Assistant Secretary Remington Kellogg. Representative Cornelius E. Gallagher of New Jersey, representing the Interparliamentary Union, also spoke at the presentation. The beavers were placed in the newly renovated pool in the section of the Park long known as Beaver Valley.

Sir Edward Hallstrom of the Taronga Zoological Park Trust of Sydney, Australia, sent eight lesser flying phalangers, a welcome addition to the collection.

Through John Hoke of the American Consulate in Paramaribo, the Government of Surinam sent a three-toed sloth. While the two-toed sloth is commonly seen in zoos and has frequently bred in the National Zoological Park, the three-toed is a rarity as it does not adapt well in captivity. This animal lived from July 2, 1960, to January 29, 1961, and produced a young one after it arrived. The baby, unfortunately, died after 14 days. When Mr. Hoke returned from his Surinam mission, he brought two more three-toed sloths and gave them to the Zoo on June 19, 1961.

The Hogle Zoo in Salt Lake City, Utah, sent the Park two kit foxes, a species that had not been represented in the collection for several years.

J. Lear Grimmer, Associate Director, made another field trip to British Guiana to study the life history of the hoatzin and returned with three red agoutis and a large collection of birds and reptiles, including the brown-throated conure, the black-headed conure, yellow-headed marsh bird, black-throated cardinal, crested oropendula, three species of ground doves, Cook's boa, and the rainbow boa.

Space does not permit a complete list of all gifts received during the year, but in addition to those already mentioned, the following are of interest:

Alston, F. J., Charlotte, N.C., sea lion.

Armstrong, Wallace J., Washington, D.C., African lungfish, 2 angelfish, peacock cichlid.

Balakirshnan, M. P., Kerala, India, Malabar squirrel.

Brady, James, Arlington, Va., night monkey.

Bump, Dr. Gardiner, New Dehli, India, jungle cat (*Felis chaus*), coppersmith (barbet).

Cate, Mrs. Robert, Washington, D.C., 2 toucans.

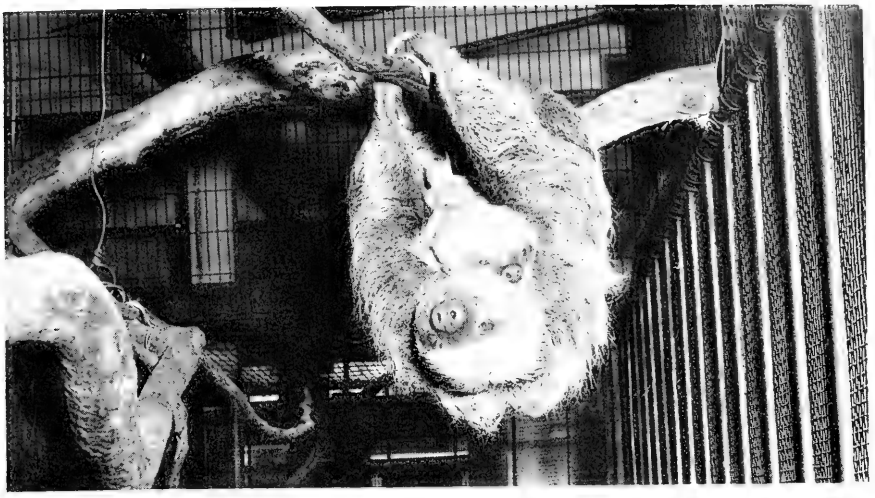
Department of Preventive Medicine, Entomology Branch, Fort Sam Houston, Tex., cacomistle.

1. Three ring-tailed lemurs from Madagascar are the first to be exhibited at National Zoological Park in many years.

2. A young serval cat, born May 2, 1961, in the National Zoological Park.

1. A clouded leopard. National Zoological Park.

2. The white tiger from Rewa. National Zoological Park.



1. A mother two-toed sloth and her two-months-old baby. National Zoological Park.

2. Male kookaburra (on the right) and three of his offspring. The second clutch of eggs can be seen in the nest at the base of tree. National Zoological Park.

Fish and Wildlife Service, Annapolis, Md., Virginia deer; Boothbay Harbor, Maine, 5 great black-backed gulls, 3 harbor seals; Eastern Shore, Md. (through Vern Stott), 2 pied-billed grebes, 6 whistling swans, 3 golden-eyed ducks, bufflehead; Turkey Bay, Md., whistling swan.
George's Pet Store, Bladensburg, Md., spider monkey.
Harbaugh, George, Mount Rainier, Md., spiny-tailed iguana.
Joy, Chief Petty Officer J. E., San Angelo, Tex., 22 western diamond-backed rattlesnakes.
Kuntz, Dr. Robert, Taipei, Taiwan, 11 green snakes, water snake, 6 green vipers (*Trimeresurus stejnegeri*), 3 green vipers (*T. gramineus*), striped rat snake.
Moynihan, Dr. Martin H., Barro Colorado Island, C.Z., 4 spider monkeys.
Muckels, R. N., Irongate, Va., spider monkey.
Nye, Alva G., McLean, Va., golden eagle.
Pinkston, Miss Nell S., Arlington, Va., tovi parakeet.
Pomeroy, Mr. and Mrs. Eugene, American Embassy, Benghazi, Libya, 2 spiny-tailed lizards.
Roeder, H. Edward, Churchtown, Md., red-crowned mangabey.
Sather, Ken, Round Lake, Minn., 3 red-breasted geese.
Stambaugh, Dean, Washington, D.C., 2 troupials, 1 yellowhammer.
Statland, Samuel, Washington, D.C., 5 African clawed frogs.
Swain, Mark, Las Vegas, Nev., puma.
Wetmore, Dr. Alexander, Washington, D.C., crowned hawk eagle.
Xanten, William Jr., Washington, D.C., collection of North American snakes.

PURCHASES

Among important purchases of the year were an African rhinoceros, three Cape buffaloes, three brindled gnus, a clouded leopard, and three ring-tailed lemurs. The Director, while in New Delhi making arrangements for the shipment of the white tiger, purchased a sizable collection of native birds, including bulbuls, tits, thrushes, parrots, and parakeets.

Other purchases of interest were:

Rocky Mountain goat
3 Patagonian cavies
Emu
5 lesser African flamingoes
4 Dalmatian pelicans
2 black-necked swans
4 coscoroba swans
Harpy eagle
2 South American lapwings
2 pileated tinamous
Quetzal
2 purple gallinules
7 Nanday parrots
2 Illiger's macaws
Concave-casqued hornbill

EXCHANGES

By the judicious use of exchanges with other zoos and with individuals the following animals were obtained:

Barcelona Zoo, Barcelona, Spain, 2 Goliath frogs.
Breazeale, Edgar, Edmonton, N.C., 6 chukar quail, 8 bobwhite quail.
Calgary Zoo, Calgary, Alberta, 2 Arctic foxes.
Cincinnati Zoo, Cincinnati, Ohio, jaguar.

Crandon Park Zoo, Miami, Fla., 3 green frogs, 4 Cuban tree frogs, 2 oak toads, 5 spadefoot toads.

Department of Commerce, Bureau of Fisheries, 2 hellbenders.

Emperor Valley Zoo, Port-of-Spain, Trinidad, 2 spider monkeys, blue tanager, 2 palm tanagers, maroon or silver-beaked tanager, violet tanager, 3 jacarini finches, 2 saffron finches, 4 purple sugarbirds, 4 yellow-winged sugarbirds, 4 bananaquits, 3 black-headed sugarbirds, 6 scarlet ibis.

Hanson, Charles, Oak Harbor, Ohio, 3 banded geckos, 2 *Uta* sp., California king snake, 2 glossy snakes, bull snake, mud snake, 2 fox snakes, garter snake (black phase), 2 island water snakes.

New York Zoological Park, New York, N.Y., 4 falcated teals, 2 triangular spotted pigeons.

Okit, W., Winston-Salem, N.C., black swan, 2 mutant pheasants.

Philadelphia Zoological Garden, Philadelphia, Pa., 4 prairie dogs.

Phillips, Mrs. Jerry, Waldorf, Md., 4 wood ducks.

Portland Zoo, Portland, Oreg., 2 alligator lizards, Columbian ground squirrel, 3 North American porcupines, 2 ring-tailed cats, 10 least chipmunks, 11 golden-mantled squirrels, 2 murres, 3 herring gulls, 6 Washington ground squirrels, chickaree, 4 chukar quail, 2 Onogadoria chickens, 2 Pacific rattlesnakes, rubber boa.

San Diego Zoo, San Diego, Calif., 2 Indian monitors, 8 valley quail, 4 Gambel's quail, 4 burrowing owls, toco toucan.

Southwest Wild Animal Farm, Blackstone, Mass., 4 peach-faced lovebirds.

Thomas, Charles, Washington, D.C., silver pheasant.

Tote-em-In Zoo, Wilmington, N.C., 2 Asiatic chipmunks, 2 European hedgehogs, 3 Indian monitors, 3 black racers.

Whiteman, Robert L., Fairfax, Va., 2 hog-nosed snakes, 3 water snakes, 2 ribbon snakes, 3 worm snakes.

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

Alipore Zoo, Calcutta, India, 4 scarlet ibises, 2 roseate spoonbills, 12 wood ducks, 2 Gambel's quail, 2 California Valley quail, 2 bobwhite quail, 2 coscorobas, sulphur-and-white-breasted toucan, white-lined toucanet, 3 cackling geese, 4 red-breasted marsh birds, cardinal, Gila monster, Mexican bearded lizard, 2 armadillos.

Barcelona Zoo, Barcelona, Spain, 10 prairie dogs.

Breazeale, E., Edmonton, N.C., 4 Canadian geese.

British Guiana Zoo, Georgetown, British Guiana, 4 domestic rabbits, 4 peafowl.

Calgary Zoo, Calgary, Alberta, Cape hunting dog, 2 brown pelicans, 2 barred owls, 3 night herons.

Ceylon Zoological Gardens, Colombo, Ceylon, 6 prairie dogs.

Cincinnati Zoo, Cincinnati, Ohio, 2 lion cubs.

Copenhagen Zoo, Copenhagen, Denmark, 6 cardinals, white-throated sparrow, 2 zebra finches, white-headed nun, blue jay, robin, 2 Java finches, 2 baldpates, 30 common Anolis.

de Lauerolle, Vasantha, Berkeley, Calif., Indian python.

Detroit Zoo, Royal Oak, Mich., 2 Pacific rattlesnakes, 2 pygmy rattlesnakes, 2 western rattlesnakes, 2 Amazon spotted turtles, 1 copperhead, 4 Taiwan cobras, 2 flat-headed turtles, South American red-lined turtle, large side-necked turtle, Murray turtle, Indian monitor, 3 Cook's boas.

Franklin Park Zoo, Boston, Mass., 3 red deer, 2 white fallow deer, 2 Virginia deer.

Hanson, Charles, Oak Harbor, Ohio, 2 Cook's boas.

Houston Zoo, Houston, Tex., South American rat snake, 2 common iguanas, 2 Indian monitors, 6 pilot black snakes, black tegu, 2 African bull frogs, fox snake, 2 Amazon spotted turtles, gibba turtle, Pacific rattlesnake, 2 manushi, glossy snake, 4 palm vipers, 2 flat-headed turtles, Formosan striped rat snake, Formosan rat snake, 2 South American red-lined turtles, milk snake, 2 Indian wolf snakes, 2 large snake-necked turtles, 2 Murray turtles, boa constrictor, Indian python, 2 Taiwan cobras, snorkel viper, 6 tree boas, Cuban boa, Indian cobra.

Portland Zoo, Portland, Oreg., Nile hippopotamus, 2 eastern box turtles, 2 yellow-bellied turtles, 2 eastern painted turtles, Florida water turtles, red-lined turtle, 2 western diamond-backed rattlesnakes, 2 African porcupines.

Sacramento Zoo, Sacramento, Calif., 2 Cape hunting dogs.

Salisbury Snake Farm, Southern Rhodesia, anaconda.

San Antonio Zoo, San Antonio, Tex., black leopard, water civet, 2 golden-bellied badgers, lesser panda, giant Indian squirrel, 2 kelp gulls, 2 American ospreys, 2 cotton teal, 10 Quaker parakeets, 3 ring-necked teal, llama, 2 Formosan masked civets, 3 Newman's genets, Patagonian cavy, sika deer, laughing thrush, 2 Formosan red-billed pies, 2 plain-breasted ground doves.

Seattle Zoo, Seattle, Wash., 3 mute swans.

Southwick Wild Animal Farm, Blackstone, Mass., 1 wild turkey.

Thomas, Charles, Washington, D.C., 2 cockatiels.

Toledo Zoo, Toledo, Ohio, 2 Cape hunting dogs.

Tote-em-In Zoo, Wilmington, N.C., 8 fallow deer, 5 Virginia deer, elk, yak, Columbian ground squirrel, 4 eastern flying squirrels.

BIRTHS AND HATCHINGS

The number of young animals born in the Zoo was gratifying and included several "firsts," either for this Zoo or for the United States. The pair of Margay cats that had a young one last year produced another kitten, which was cared for by the mother. A baby serval was taken away from its mother and raised by hand. The Canadian beavers, which were gifts from the Canadian Government, had a young one just after arriving in the park and before the formal presentation by Canadian officials, and so it was on view during the ceremony. The Dorcas gazelles were equally obliging and had their fawn at the time when President Bourguiba of Tunisia, who gave the original pair to Mrs. John Eisenhower, was in Washington.

A pair of kookaburras, a gift in 1954 from Sir Edward Hallstrom of the Taronga Zoological Park Trust in Sydney, Australia, began laying eggs in February 1961. The nest was built in an opening at the base of a hollow tree, and the birds excavated the site until the nest was 2 or 3 inches below ground level. Three eggs were laid, and the male and female birds took turns incubating them, neither bird leaving the nest until the other had replaced it during the 25 days of incubation. On four occasions the female was observed calling the male by rapping on the tree with her bill, and the male responded immediately and entered the nest. The kookaburras had always been

fed on dead mice, and before the eggs hatched the keepers began accustoming the adults to eating mice that had been cut up in small pieces. These chopped mice, supplemented with cockroaches that had been injected with multivitamins, were fed directly to the young birds by the parents after the old birds had crushed them thoroughly either in their bills or by rapping them against the tree. Thirty days after hatching, the first bird left the nest, but they continued to be fed by the parents until they were 2 months old. Before the first brood was self-reliant, the female began laying eggs again, and two more young were hatched on June 5.

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

MAMMALS

Common name	*Scientific name*	*Number*
Rat kangaroo	*Potorous* sp.	2
Night monkey	*Aotus trivirgatus*	2
Squirrel monkey	*Saimiri sciureus*	2
Hybrid macaque	*Macaca philippiensis* x *M. irus*	1
Rhesus monkey	*Macaca mulatta*	1
Barbary ape	*Macaca sylvanus*	3
Moustached monkey	*Cercopithecus cephus*	1
DeBrazza's guenon	*Cercopithecus neglectus*	2
White-handed gibbon	*Hylobates lar*	1
Chimpanzee	*Pan satyrus*	1
Two-toed sloth	*Choloepus didactylus*	1
Three-toed sloth	*Bradypus tridactylus*	1
Beaver	*Castor canadensis*	1
Prairie dog	*Cynomys ludovicianus*	3
African crested rat	*Lophiomys* sp.	1
White-footed mouse	*Peromyscus* sp.	1
Deer mouse	*Peromyscus maniculatus*	5
African porcupine	*Hystrix galeata*	3
Patagonian cavy	*Dolichotis patagona*	4
Dingo	*Canis antarcticus*	1
Common jackal	*Canis aureus*	6
Timber wolf	*Canis lupus nubilus*	3
Cape hunting dog	*Lycaon pictus*	5
European brown bear	*Ursus arctos*	5
Grizzly bear	*Ursus horribilis*	2
Hybrid bear F2	*Thalarctos maritimus* x *Ursus middendorffi*	4
Coatimundi	*Nasua narica*	3
Newman's genet	*Genetta genetta neumanii*	4
Water civet	*Atilax paludinosus*	3
Serval	*Felis serval*	2
Margay cat	*Felis wiedii*	1
Lion	*Panthera leo*	2
Peccary	*Pecari tajacu*	1

Common name	*Scientific name*	*Number*
Nile hippopotamus	*Hippopotamus amphibius*	1
Llama	*Lama glama*	4
Bactrian camel	*Camelus bactrianus*	1
White fallow deer	*Dama dama*	4
Axis deer	*Axis axis*	2
Red deer	*Cervus elaphus*	2
Sika deer	*Cervus nippon*	4
Virginia deer	*Odocoileus virginianus*	7
Reindeer	*Rangifer tarandus*	3
Dorcas gazelle	*Gazella dorcas*	1
Barbary sheep	*Ammotragus lervia*	1
Rocky Mountain sheep	*Ovis canadensis*	1
BIRDS		
Mute swan	*Cygnus olor*	6
Whooper swan	*Olor cygnus*	3
Wood duck	*Aix sponsa*	2
American pintail	*Anas acuta*	9
Mandarin duck	*Dendronessa galericulata*	22
Golden pheasant	*Chrysolophus pictus*	4
Jungle fowl	*Gallus gallus*	7
Wild turkey	*Meleagris gallopava*	2
Quaker parakeet	*Myopsittacus monachus*	8
Burrowing owl	*Spectyto cunicularis hypugaea*	1
Kookaburra	*Dacelo gigas*	5
REPTILES		
Snapping turtle	*Chelydra serpentina*	11
Box turtle	*Terrapene carolina*	24
Painted turtle	*Chrysemys picta*	8
Yellow-bellied turtle	*Pseudemys scripta* sp	47
Red-lined turtle	*Pseudemys scripta callirostris*	55
Red-bellied turtle	*Pseudemys rubriventris*	12
Red-lined turtle	*Pseudemys elegans*	16
Eastern water snake	*Natrix sipedon*	14
Florida green water snake	*Natrix cyclopion floridana*	29
Island water snake	*Natrix insularum*	45
Garter snake	*Thamnophis sirtalis*	11
Ribbon snake	*Thamnophis sauritus*	4
Black racer	*Coluber constrictor*	4
Pilot black snake	*Elaphe obsoleta*	13
Taiwan cobra	*Naja naja atra*	7
Northern copperhead	*Ancistrodon contortrix*	12
FISHES		
African mouthbreeder	*Pelmatochromis guentheri*	15

The importance of a zoological collection rests, to a large extent, upon the diversity and scope of its representation throughout the whole of the animal kingdom. The National Zoological Park has

enjoyed some measure of success in efforts to add representative species belonging to little-known or absent families.

The total number of accessions for the year was 1,371. This includes gifts, purchases, exchanges, deposits, births, and hatchings. Several minor species, which are best displayed in large numbers, do not have an individual count, merely being listed as "many."

STATUS OF THE COLLECTION

Class	Order	Family	Species or subspecies	Individuals
Mammals	15	51	244	627+
Birds	22	77	419	1,196+
Reptiles	4	23	161	414+
Amphibians	2	11	25	108+
Fish	4	8	21	86+
Arthropods	3	3	3	Many
Mollusks	1	1	1	Many
Total	51	174	874	2,431+

ANIMALS IN THE COLLECTION ON JUNE 30, 1961

MAMMALS

MONOTREMATA

Family and common name	*Scientific name*	*Number*
Tachyglossidae:		
Echidna, or spiny anteater	*Tachyglossus aculeatus*	1

MARSUPIALIA

Didelphidae:		
Opossum	*Didelphis marsupialis*	5
Dasyuridae:		
Tasmanian devil	*Sarcophilus harrisii*	1
Phalangeridae:		
Sugar glider	*Petaurus breviceps*	4
Squirrel glider	*Petaurus norfolcensis*	7
Phascolomidae:		
Hairy-nosed wombat	*Lasiorhinus latifrons*	2
Mainland wombat	*Wombatus hirsutus*	1
Macropodidae:		
Red kangaroo	*Macropus rufus*	1
Tree kangaroo	*Dendrolagus matschici*	3
Rat kangaroo	*Potorous* sp.	7

INSECTIVORA

Erinaceidae:		
European hedgehog	*Erinaceus europaeus*	2

CHIROPTERA

Family and common name	*Scientific name*	*Number*
Vespertilioninae:		
Little brown bat	*Myotis lucifugus*	1

PRIMATES

Lemuridae:		
Ring-tailed lemur	*Lemur catta*	3
Lorisidae:		
Great galago	*Galago crassicaudatus*	2
Senegal galago	*Galago senegalensis*	2
Dwarf galago	*Galago senegalensis zanzibarisus*	2
Slow loris	*Nycticebus coucang*	1
Common potto	*Perodicticus potto*	2
Cebidae:		
Night monkey	*Aotus trivirgatus*	3
Brown capuchin monkey White-throated capuchin Capuchin	*Cebus capucinus*	10
Squirrel monkey	*Saimiri sciureus*	7
Black spider monkey	*Ateles fusciceps*	5
Spider monkey	*Ateles geoffroyi*	5
Woolly monkey	*Lagothrix* sp.	1
Callithricidae:		
Cottontop marmoset	*Saguinus oedipus*	1
Black-and-red tamarin	*Saguinus nigricollis*	1
Cercopithecidae:		
Toque, or bonnet monkey	*Macaca sinica*	3
Javan macaque	*Macaca irus mordax*	2
Crab-eating macaque	*Macaca irus*	1
Philippine macaque	*Macaca philippinensis*	2
Macaque hybrid	*Macaca philippinensis* X *Macaca irus*	2
Rhesus monkey	*Macaca mulatta*	4
Formosan monkey	*Macaca cyclopis*	2
Red-faced macaque	*Macaca speciosa*	1
Barbary ape	*Macaca sylvanus*	13
Moor macaque	*Macaca maurus*	1
Gray-cheeked mangabey	*Cercocebus albigena*	1
Agile mangabey	*Cercocebus galeritus agilis*	1
Golden-bellied mangabey	*Cercocebus galeritus chrysogaster*	1
Red-crowned mangabey	*Cercocebus torquatus*	2
Sooty mangabey	*Cercocebus fuliginosus*	5
Crested mangabey	*Cercocebus aterrimus opdenboschii*	2
Blacked-crested mangabey	*Cercocebus aterrimus*	3
Chacma baboon	*Papio comatus*	1
Mandrill	*Mandrillus sphinx*	1
Gelada baboon	*Theropithecus gelada*	1
Vervet guenon	*Ceropithecus aethiops pygerythrus*	1
Green guenon	*Cercopithecus aethiops sabaeus*	2

Family and common name	*Scientific name*	*Number*
Cercopithecidae—Continued		
Guenon, hybrid	*Cercopithecus aethiops* X *C. A. pygerythrus*	2
Moustached monkey	*Cercopithecus cephus*	3
Diana monkey	*Cercopithecus diana*	1
Roloway monkey	*Cercopithecus diana roloway*	1
Preuss's guenon	*Cercopithecus l'hoesti preussi*	1
DeBrazza's guenon	*Cercopithecus neglectus*	3
White-nosed guenon	*Cercopithecus nictitans*	1
Lesser white-nosed guenon	*Cercopithecus nictitans petaurista*	1
Allen's monkey	*Allenopithecus nigroviridis*	2
Spectacled, or Phayre's langur	*Presbytis phayrei*	1
Entellus, or Hanuman monkey	*Presbytis entellus*	2
Langur	*Presbytis* sp.	1
Pongidae:		
White-handed gibbon	*Hylobates lar*	5
Wau-wau gibbon	*Hylobates moloch*	1
Gibbon, hybrid	*Hylobates agilis* X *H. lar pileatus*	1
Gibbon, hybrid	*Hylobates lar* X *H.* sp.	2
Sumatran orangutan	*Pongo pygmaeus*	2
Bornean orangutan	*Pongo pygmaeus abelii*	1
Chimpanzee	*Pan satyrus*	4
Gorilla	*Gorilla gorilla*	2
EDENTATA		
Myrmecophagidae:		
Giant anteater	*Myrmecophaga tridactyla*	1
Bradypodidae:		
Three-toed sloth	*Bradypus tridactylus*	1
Two-toed sloth	*Choloepus didactylus*	6
Dasypodidae:		
Nine-banded armadillo	*Dasypus novemcinctus*	1
LAGOMORPHA		
Leporidae:		
Domestic rabbit	*Oryctolagus cuniculus*	7
RODENTIA		
Aplodontidae:		
Mountain beaver	*Aplodontia rufa*	1
Sciuridae:		
Gray squirrel (black)	*Sciurus carolinensis*, melanistic phase	2
Gray squirrel (albino)	*Sciurus carolinensis*	3
Fox squirrel	*Sciurus niger*	1
Chickaree	*Tamiasciurus douglasii*	1
Giant Indian squirrel	*Ratufa indica*	2
Asiatic squirrel	*Callosciurus nigrovittatus*	1
Formosan tree squirrel	*Callosciurus erythraeus*	3
Asiatic forest squirrel	*Callosciurus caniceps*	3
Striped ground squirrel	*Lariscus insignis*	1
Long-nosed squirrel	*Dremomys rufigenis*	1
Woodchuck, or groundhog	*Marmota monax*	2

Family and common name	*Scientific name*	*Number*
Sciuridae—Continued		
Prairie dog	*Cynomys ludovicianus*	6
Round-tailed ground squirrel	*Citellus tereticaudus*	1
California ground squirrel	*Citellus beecheyi*	1
Washington ground squirrel	*Citellus washingtoni*	5
Golden-mantled ground squirrel	*Citellus lateralis*	4
Eastern chipmunk	*Tamias striatus*	2
Eastern chipmunk (albino)	*Tamias striatus*	1
Yellow-pine chipmunk	*Eutamias amoenus*	7
Indian palm squirrel	*Funambulus palmarum*	1
Formosan flying squirrel	*Petaurista grandis*	1
Eastern flying squirrel	*Glaucomys volans*	6
Castoridae:		
Beaver	*Castor canadensis*	3
Cricetidae:		
Golden hamster	*Mesocricetus auratus*	1
White-footed mouse	*Peromyscus* sp.	11
Pine vole	*Pitymys pinetorum*	2
Gerbil	*Gerbillus pyramidum*	2
Fat-tailed gerbil	*Pachyuromys duprasi*	Many
Hairy-tailed jird	*Sekeetamys calurus*	1
Jird	*Meriones* sp.	8
Muridae:		
Egyptian spiny mouse	*Acomys cahirinus*	10
Egyptian spiny mouse	*Acomys dimidiatus*	Many
Multimammate mouse	*Mastomys* sp.	2
Crested rat	*Lophiomys* sp.	4
Slender-tailed cloud rat	*Phloeomys cumingii*	1
Gliridae:		
African dormouse	*Graphiurus murinus*	1
Hystricidae:		
Malay porcupine	*Acanthion brachyura*	1
African porcupine	*Hystrix galeata*	7
Caviidae:		
Patagonian cavy	*Dolichotis patagona*	6
Dasyproctidae:		
Red agouti	*Dasyprocta* sp.	3
Chinchillidae:		
Peruvian viscaccia	*Lagidium viscaccia*	1
CARNIVORA		
Canidae:		
Dingo	*Canis antarcticus*	3
Coyote	*Canis latrans*	1
Common jackal	*Canis aureus*	3
Timber wolf	*Canis lupus nubilus*	2
Texas red wolf	*Canis niger rufus*	2
Arctic fox	*Alopex lagopus*	2
Red fox	*Vulpes fulva*	1
Kit fox	*Vulpes macrotis*	2
Fennec	*Fennecus zerda*	2
Big-eared fox	*Otocyon megalotis*	1
Raccoon dog	*Nyctereutes procyonoides*	3

Family and common name	*Scientific name*	*Number*
Canidae—Continued		
Cape hunting dog	*Lycaon pictus*	2
Ursidae:		
Spectacled bear	*Tremarctos ornatus*	1
Himalayan bear	*Selenarctos thibetanus thibetanus*	2
Japanese black bear	*Selenarctos thibetanus japonicus*	1
Korean bear	*Selenarctos thibetanus ussuricus*	2
Black bear	*Euarctos americanus*	2
European brown bear	*Ursus arctos*	3
Iranian brown bear	*Ursus arctos occidentalis*	2
Alaskan Peninsula bear	*Ursus gyas*	2
Grizzly bear	*Ursus horribilis*	2
Sitka brown bear	*Ursus sitkensis*	1
Polar bear	*Thalarctos maritimus*	2
Hybrid bear	*Thalarctos maritimus X Ursus middendorffi*	4
Malay sun bear	*Helarctos malayanus*	2
Sloth bear	*Melursus ursinus*	2
Procyonidae:		
Raccoon	*Procyon lotor*	10
Raccoon (black phase)	*Procyon lotor*	1
Raccoon (albino)	*Procyon lotor*	1
Coatimundi	*Nasua narica*	4
Cacomistle, or ring-tailed cat	*Bassariscus astutus*	5
Kinkajou	*Potos flavus*	4
Olingo	*Bassaricyon gabbi*	2
Lesser panda	*Ailurus fulgens*	3
Mustelidae:		
Ferret	*Mustela eversmanni*	1
Marten	*Martes americana*	1
Fisher	*Martes pennanti*	1
Tayra	*Eira barbara*	1
Grison	*Galictis vittata*	1
Zorilla, or striped weasel	*Ictonyx capensis*	2
Wolverine	*Gulo luscus*	1
American badger	*Taxidea taxus*	1
Golden-bellied ferret-badger	*Helictis moschata subauratiaca*	3
Common skunk	*Mephitis mephitis*	3
California spotted skunk	*Spilogale putorius phenax*	1
South American flat-tailed otter	*Pteronura brasiliensis*	1
Viverridae:		
Genet	*Genetta genetta neumanii*	8
Genet (black phase)	*Genetta genetta neumanii*	1
Formosan spotted civet	*Viverricula indica*	2
Ground civet	*Viverra tangalunga*	1
Linsang	*Prionodon linsang*	1
African palm civet	*Nandinia binotata*	2
Formosan masked civet	*Paguma larvata taivana*	1
Binturong	*Arctictis binturong*	1

Family and common name	*Scientific name*	*Number*
Viverridae—Continued		
African gray mongoose	*Herpestes ichneumon*	1
Black-footed mongoose	*Bdeogale* sp.	2
African water civet	*Atilax paludinosus*	5
Striped African mongoose	*Crossarchus fasciatus*	2
White-tailed civet	*Ichneumia albicauda*	1
Cryptoproctidae:		
Fossa	*Cryptoprocta ferox*	1
Hyaenidae:		
Striped hyena	*Hyaena hyaena*	2
Felidae:		
Jungle cat	*Felis chaus*	2
Pallas's cat	*Felis manul*	2
Serval cat	*Felis serval*	4
Ocelot	*Felis pardalis*	2
Margay cat	*Felis wiedii tigrina*	4
Puma	*Felis concolor*	3
Lynx	*Lynx canadensis*	1
Bobcat	*Lynx rufus*	2
Leopard	*Panthera pardus*	5
Black leopard	*Panthera pardus*	2
Lion	*Panthera leo*	3
Bengal tiger	*Panthera tigris*	3
Bengal tiger (white phase)	*Panthera tigris*	1
Jaguar	*Panthera onca*	2
Clouded leopard	*Neofelis nebulosa*	1
Snow leopard	*Panthera uncia*	3
Cheetah	*Acinonyx jubata*	2
PINNIPEDIA		
Otariidae:		
California sea-lion	*Zalophus californianus*	6
Patagonian sea-lion	*Otaria flavescens*	1
Phocidae:		
Harbor seal	*Phoca vitulina*	3
TUBULIDENTATA		
Orycteropodidae:		
Aardvark, or antbear	*Orycteropus afer*	1
PROBOSCIDEA		
Elephantidae:		
African elephant	*Loxodonta africana*	1
Forest elephant	*Loxodonta cyclotis*	1
Indian elephant	*Elephas maximus*	2
HYRACOIDEA		
Procaviidae:		
Hyrax	*Procavia syriaca*	1
PERISSODACTYLA		
Equidae:		
Mongolian wild horse	*Equus przewalskii*	1
Burro, or donkey	*Equus asinus*	1
Grant's zebra	*Equus burchelli boehmi*	3

Family and common name	*Scientific name*	*Number*
Equidae—Continued		
Grevy's zebra	*Equus grevyi*	2
Tapiridae:		
Brazilian tapir	*Tapirus terrestris*	1
Rhinocerotidae:		
Great one-horned Indian rhinoceros	*Rhinoceros unicornis*	1
White, or square-lipped rhinoceros	*Ceratotherium simum*	2
African black rhinoceros	*Diceros bicornis*	1
ARTIODACTYLA		
Tayassuidae:		
Collared peccary	*Pecari tajacu*	3
Hippopotamidae:		
Hippopotamus	*Hippopotamus amphibius*	2
Pygmy hippopotamus	*Choeropsis liberiensis*	4
Camelidae:		
Llama	*Lama glama*	6
Guanaco	*Lama glama guanicoe*	3
Alpaca	*Lama pacos*	4
Bactrian camel	*Camelus bactrianus*	2
Cervidae:		
White fallow deer	*Dama dama*	6
Axis deer	*Axis axis*	5
Red deer	*Cervus elaphus*	8
American elk	*Cervus canadensis*	2
Sika deer	*Cervus nippon*	10
Père David's deer	*Elaphurus davidianus*	1
Virginia deer	*Odocoileus virginianus*	9
Reindeer	*Rangifer tarandus*	13
Forest caribou	*Rangifer caribou*	1
Giraffidae:		
Nubian giraffe	*Giraffa camelopardalis*	1
Antilocapridae:		
Pronghorn	*Antilocapra americana*	1
Bovidae:		
Sitatunga	*Tragelaphus spekii*	1
Brindled gnu	*Connochaetes taurinus*	3
Anoa	*Anoa depressicornis*	2
Zebu	*Bos indicus*	1
Yak	*Poephagus grunniens*	3
Gaur	*Bibos gaurus*	3
African buffalo	*Syncerus caffer*	4
American bison	*Bison bison*	2
Wisent, or European bison	*Bison bonasus*	2
Dorcas gazelle	*Gazella dorcas*	3
Rocky mountain goat	*Oreamnos americanus*	3
Tahr	*Hermitragus jemlahicus*	1
Ibex	*Capra ibex*	1
Blue sheep	*Pseudois nayaur*	1
Aoudad	*Ammotragus lervia*	4
Big-horn sheep	*Ovis canadensis*	5
Dall sheep	*Ovis dalli dalli*	2

BIRDS

SPHENISCIFORMES

Family and common name	*Scientific name*	*Number*
Spheniscidae:		
King penguin	*Aptenodytes patagonica*	4
Adélie penguin	*Pygoscelis adeliae*	2

STRUTHIONIFORMES

Struthionidae:		
Ostrich	*Struthio camelus*	1

RHEIFORMES

Rheidae:		
Rhea	*Rhea americana*	1

CASUARIIFORMES

Casuariidae:		
Cassowary	*Casuarius* sp.	2
Dromiceidae:		
Emu	*Dromiceius novaehollandiae*	5

TINANIIFORMES

Tinamidae:		
Pileated tinamou	*Crypturus soui panamensis*	1

PROCELLARIIFORMES

Diomedeidae:		
Black-footed albatross	*Diomedea nigripes*	2

PELECANIFORMES

Pelecanidae:		
Rose-colored pelican	*Pelecanus onocrotalus*	2
White pelican	*Pelecanus erythrorhynchos*	3
Brown pelican	*Pelecanus occidentalis*	1
Dalmatian pelican	*Pelecanus crispus*	4
Phalacrocoracidae:		
Double-crested cormorant	*Phalacrocorax auritus auritus*	4
Farallon cormorant	*Phalacrocorax auritus albociliatus*	1
European cormorant	*Phalacrocorax carbo*	6
Anhingidae:		
Anhinga, or snakebird	*Anhinga anhinga*	1
Indian darter	*Anhinga melanogaster*	2

CICONIIFORMES

Ardeidae:		
Reddish egret	*Dichromanassa rufescens*	3
Reddish egret (white phase)	*Dichromanassa rufescens*	1
Cattle egret	*Bubulcus ibis*	3
American egret	*Casmerodius albus*	1

Family and common name	*Scientific name*	*Number*
Ardeidae—Continued		
Snowy egret	*Leucophoyx thula*	2
Great white heron	*Ardea occidentalis*	2
Eastern green heron	*Butoribes virescens*	3
Louisiana heron	*Hydranassa tricolor*	3
Black-crowned night heron	*Nycticorax nycticorax*	12
Little blue heron	*Florida caerulea*	1
Least bittern	*Ixobrychus exilis*	1
Tiger bittern	*Tigrisoma lineatum*	2
Cochleariidae:		
Boat-billed heron	*Cochlearius cochlearius*	1
Balaenicipitidae:		
Shoebill	*Balaeniceps rex*	1
Ciconiidae:		
American wood ibis	*Mycteria americana*	3
European white stork	*Ciconia ciconia*	4
Indian adjutant stork	*Leptoptilos dubius*	1
White-bellied stork	*Abdimia sphenorhyncha*	2
Threskiornithidae:		
White ibis	*Eudocimus albus*	2
Scarlet ibis	*Eudocimus ruber*	4
Black-faced ibis	*Theristicus melanopis*	1
Blackheaded ibis	*Threskiornis melanocephala*	1
White-faced glossy ibis	*Plegadis mexicana*	2
Eastern glossy ibis	*Plegadis falcinellus*	5
Roseate spoonbill	*Ajaia ajaja*	6
Phoenicopteridae:		
Chilean flamingo	*Phoenicopterus chilensis*	2
Cuban flamingo	*Phoenicopterus ruber*	1
Old World flamingo	*Phoenicopterus antiquorum*	1
Lesser flamingo	*Phoeniconais minor*	2
ANSERIFORMES		
Anhimidae:		
Crested screamer	*Chauna torquata*	4
Anatidae:		
Coscoroba swan	*Coscoroba coscoroba*	4
Mute swan	*Cygnus olor*	6
Black-necked swan	*Cygnus melancoriphus*	2
Whooper swan	*Olor cygnus*	4
Whistling swan	*Olor columbianus*	11
Trumpeter swan	*Olor buccinator*	2
Black swan	*Chenopis atrata*	2
Egyptian goose	*Alopochen aegyptiacus*	1
White-fronted goose	*Anser albifrons*	3
Indian bar-headed goose	*Eulabeia indica*	5
Emperor goose	*Philacte canagica*	2
Blue goose	*Chen caerulescens*	6
Lesser snow goose	*Chen hyperborea hyperborea*	2
Greater snow goose	*Chen hyperborea atlantica*	5
Ross's goose	*Chen rossii*	4
Red-breasted goose	*Branta ruficollis*	4

Family and common name	*Scientific name*	*Number*
Anatidae—Continued		
Canada goose, Lesser Canada goose, Cackling goose, White-cheeked goose	*Branta canadensis*	30
Canada goose X blue goose, hybrid	*Branta canadensis* X *Chen caerulescens*	2
Wood duck	*Aix sponsa*	Many
Wood duck X red-headed duck, hybrid	*Aix sponsa* X *Aythya americana*	1
Pintail duck	*Anas acuta*	10
Chestnut-breasted teal	*Anas castanea*	1
Gadwall	*Anas strepera*	5
European wigeon	*Anas penelope*	5
Mallard duck	*Anas platyrhynchos*	25
Mallard duck, albino	*Anas platyrhynchos*	1
Mallard duck X American pintail duck, hybrid.	*Anas platyrhynchos* X *Anas acuta*	1
Indian spotted-billed duck	*Anas poecilorhyncha*	1
Black duck	*Anas rubripes*	9
Greater scaup duck	*Aythya marila*	7
Lesser scaup duck	*Aythya affinis*	5
Red-headed duck	*Aythya americana*	9
Ring-necked duck	*Aythya collaris*	3
Canvasback duck	*Aythya valisineria*	7
Bufflehead duck	*Bucephala albeola*	1
American goldeneye	*Bucephala clangula americana*	1
Black-bellied tree duck	*Dendrocygna autumnalis*	2
Fulvous tree duck	*Dendrocygna bicolor*	1
Mandarin duck	*Dendronessa galericulata*	18
Baldpate	*Mareca americana*	10
Rosy-billed pochard	*Metopiana peposaca*	1
Red-crested pochard	*Netta rufina*	1
Cotton teal	*Nettapus coromandelianus*	4
Comb duck	*Sarkidiornis melanota*	1
South African sheldrake	*Casarca cana*	1
Ruddy shelduck	*Casarca ferruginea*	2
European shelduck	*Tadorna tadorna*	1
FALCONIFORMES		
Cathartidae:		
Andean condor	*Vultur gryphus*	1
King vulture	*Sarcoramphus papa*	1
Black vulture	*Coragyps atratus*	6
Hooded vulture	*Necrosyrtes monachus*	1
Ruppell's vulture	*Gyps rueppellii*	3
Turkey vulture	*Cathartes aura*	9
Sagittariidae:		
Secretarybird	*Sagittarius serpentarius*	2
Accipitridae:		
African yellow-billed kite	*Milvus migrans*	2
Brahminy kite	*Haliastur indus*	1
Black-faced hawk	*Leucopternis melanops*	1
Red-winged hawk	*Heterospizias meridionalis*	1

Family and common name	*Scientific name*	*Number*
Accipitridae—Continued		
Red-tailed hawk	*Buteo jamaicensis*	3
Red-shouldered hawk	*Buteo lineatus*	1
Swainson's hawk	*Buteo swainsoni*	1
Mauduyt's hawk-eagle	*Spizaetus ornatus*	1
Great black hawk	*Ictinaetus malayensis*	1
Golden eagle	*Aquila chrysaetos*	3
Imperial eagle	*Aquila heliaca*	2
White-breasted sea eagle	*Haliaetus leucogaster*	1
Pallas's eagle	*Haliaetus leucoryphus*	1
Bald eagle	*Haliaetus leucocephalus*	5
Buzzard eagle	*Buteo poecilochrous*	1
Harpy eagle	*Harpia harpyja*	2
Guianan crested eagle	*Morphnus guianensis*	1
Monkey-eating eagle	*Pithecophaga jefferyi*	1
Bateleur eagle	*Terathopius ecaudatus*	2
Bearded vulture	*Gypaetus barbatus*	1
Falconidae:		
Sparrow hawk	*Falco sparverius*	5
Duck hawk	*Falco peregrinus anatum*	1
Red-footed falcon, or crane hawk	*Falco vespertinus*	1
Forest falcon	*Micrastur semitorquatus*	2
Chimango	*Milvago chimango*	2
Chimachima hawk	*Milvago chimachima*	1
Audubon's caracara	*Polyborus cheriway*	3
White-throated caracara	*Phalcoboenus albogularis*	3
GALLIFORMES		
Megapodiidae:		
Brush turkey	*Alectura lathami*	1
Cracidae:		
Blue-cered curassow	*Crax alberti*	1
Wattled curassow	*Crax globulosa*	2
Panama curassow	*Crax panamensis*	1
Nocturnal curassow	*Nothocrax urumutum*	1
White-headed piping guan	*Pipile cumanensis*	1
Phasianidae:		
Erckel's francolin	*Francolinus erckeli*	1
Hildebrandt's francolin	*Francolinus hildebrandti*	2
Bob-white	*Colinus virginianus*	1
Chukar quail	*Alectoris graeca*	4
Gambel's quail	*Lophortyx gambeli*	2
Valley quail	*Lophortyx vallicola*	6
Argus pheasant	*Argusianus argus*	1
Golden pheasant	*Chrysolophus pictus*	7
Onogadori chicken	*Gallus gallus*	2
Red junglefowl	*Gallus gallus*	6
Nepal pheasant	*Gennaeus leucomelanus*	2
Black-backed kaleege pheasant	*Gennaeus melanonotus*	2
Silver pheasant	*Gennaeus nycthemerus*	1
Peafowl	*Pavo cristatus*	5
Ring-necked pheasant	*Phasianus colchicus*	4
Ring-necked pheasant, albino	*Phasianus colchicus*	2

Family and common name	*Scientific name*	*Number*
Phasianidae—Continued		
Ring-necked pheasant X green pheasant, hybrid	*Phasianus colchicus* X *P. versicolor*	1
Bhutan, or gray peacock pheasant	*Polyplectron bicalcaratum*	2
Reeves's pheasant	*Syrmaticus reevesi*	2
Numididae:		
Vulturine guineafowl	*Acryllium vulturinum*	3
Meleagrididae:		
Ocellated turkey	*Agriocharis ocellata*	2
Wild turkey	*Meleagris gallopavo*	5
GRUIFORMES		
Gruidae:		
Siberian crane	*Grus leucogeranus*	1
Demoiselle crane	*Anthropoides virgo*	1
Sarus crane	*Antigone antigone*	2
African crowned crane	*Balearica pavonina*	6
Psophiidae:		
Trumpeter	*Psophia crepitans*	2
Rallidae:		
Cayenne wood rail	*Aramides cajanea*	2
Virginia rail	*Rallus limicola*	1
King rail	*Rallus elegans*	1
Purple gallinule	*Ionornis martinica*	2
South Pacific swamp-hen	*Porphyrio poliocephalus*	1
American coot	*Fulica americana*	1
Eurypygidae:		
Sun bittern	*Eurypyga helias*	1
Cariamidae:		
Cariama, or seriama	*Cariama cristata*	1
Otididae:		
Senegal bustard	*Eupodotis senegalensis*	2
CHARADRIIFORMES		
Jacanidae:		
Common jacana	*Jacana spinosa*	2
Haematopodidae:		
Oystercatcher	*Haematopus ostralegus*	2
Charadriidae:		
Golden plover	*Charadrius apricarius*	2
Australian banded plover	*Zonifer tricolor*	3
European lapwing	*Vanellus vanellus*	4
South American lapwing	*Belonopterus cayennensis*	4
Crocodile bird	*Pluvialis aegyptius*	7
Scolopacidae:		
Pectoral sandpiper	*Erolia melanotos*	1
Recurvirostridae:		
Black-necked stilt	*Himantopus mexicanus*	1
Burhinidae:		
South American thick-knee	*Burhinus bistriatus*	1
Stercorariidae:		
MacCormick's skua	*Catharacta maccormicki*	2

Family and common name	*Scientific name*	*Number*
Laridae:		
Ring-billed gull	*Larus delawarensis*	3
Kelp gull	*Larus dominicanus*	3
Laughing gull	*Larus atricilla*	1
Herring gull	*Larus argentatus*	3
Western, or California gull	*Larus argentatus californicus*	2
Great black-backed gull	*Larus marinus*	2
Silver gull	*Larus novaehollandiae*	8
Franklin's gull	*Larus pipixcan*	2
Noddy tern	*Anous stolidus*	2
Common tern	*Sterna hirunde hirunde*	4
COLUMBIFORMES		
Columbidae:		
Band-tailed pigeon	*Columba fasciata*	2
High-flying Budapest pigeon	*Columba livia*	9
Black-billed pigeon	*Columbia nigrirostris*	1
Triangular spotted pigeon	*Columba guinea*	2
Crowned pigeon	*Goura victoria*	1
Blue ground dove	*Claravis pretiosa*	5
Ruddy ground dove	*Chaemepelia rufipennis*	7
Indian emerald-winged tree dove	*Chalcophaps indica*	10
Bleeding-heart dove	*Gallicolumba luzonica*	2
Diamond dove	*Geopelia cuneata*	1
Plain-breasted ground dove	*Columbigallina minuta*	12
Ground dove	*Columbigallina passerina*	5
Ring-necked dove	*Streptopelia decaocto*	7
Blue-headed ring dove	*Streptopelia tranquebarica*	2
White-winged dove	*Zenaida asiatica*	1
Mourning dove	*Zenaidura macroura*	3
PSITTACIFORMES		
Psittacidae:		
Kea parrot	*Nestor notabilis*	2
Red lory	*Domicella garrula*	2
Banksian cockatoo	*Calyptorhynchus magnificus*	1
White cockatoo	*Kakatoe alba*	2
Solomon Islands cockatoo	*Kakatoe ducrops*	1
Sulphur-crested cockatoo	*Kakatoe galerita*	4
Bare-eyed cockatoo	*Kakatoe sanguinea*	5
Great red-crested cockatoo	*Kakatoe moluccensis*	1
Leadbeater's cockatoo	*Kakatoe leadbeateri*	7
Cockatiel	*Nymphicus hollandicus*	7
Yellow-and-blue macaw	*Ara ararauna*	3
Red-and-blue macaw	*Ara chloroptera*	3
Red-blue-and-yellow macaw	*Ara macao*	2
Illiger's macaw	*Ara maracana*	2
Brown-throated conure	*Conurus aeruginosus*	2
Petz's parakeet	*Aratinga canicularis*	1
Rusty-cheeked parrot	*Aratinga pertinax*	2
Tovi parakeet	*Brotogeris jugularis*	1
Yellow-naped parrot	*Amazona auropalliata*	5

Family and common name	*Scientific name*	*Number*
Psittacidae—Continued		
Finsch's parrot	*Amazona finschi*	1
Blue-fronted parrot	*Amazona aestiva*	1
Red-fronted parrot	*Amazona bodini*	1
Double yellow-headed parrot	*Amazona oratrix*	3
Black-headed, or Nanday parrot	*Nandayus nanday*	9
Lineolated parakeet	*Bolborhynchus lineolatus*	7
White-winged parakeet	*Brotogeris versicolurus*	1
Malabar, or blue-winged parrot	*Psittacula columboides*	4
Blossom-headed parakeet	*Psittacula cyanocephala*	10
Greater ring-necked parakeet	*Psittacula eupatria*	3
Rose-breasted parakeet	*Psittacula alexandri*	1
Moustached parakeet	*Psittacula fasciata*	1
Lesser ring-necked parakeet	*Psittacula krameri*	6
Barraband's parakeet	*Polytelis swainsoni*	1
Quaker parakeet	*Myopsittacus monachus*	17
Budgerigar, or grass parakeet	*Melopsittacus undulatus*	4
Rosy-faced lovebird	*Agapornis roseicollis*	2
Masked lovebird	*Agapornis personata*	1
Black-headed caique, or seven-color parrot	*Pionites melanocephala*	2
Yellow-thighed caique	*Pionites leucogaster xanthomeria*	1
CUCULIFORMES		
Musophagidae:		
Purple-headed turaco	*Gallirex porphyreolophus*	1
South African turaco	*Tauraco corythaix*	2
White-bellied go-away bird	*Corythaixoides leucogaster*	1
Plantain-eater	*Crinifer africanus*	1
Cuculidae:		
Koel	*Eudynamys scolopacea*	1
Roadrunner	*Geococcyx californianus*	2
Coucal, or crow-pheasant	*Centropus sinensis*	3
STRIGIFORMES		
Tytonidae:		
Barn owl	*Tyto alba*	1
Strigidae:		
Great horned owl	*Bubo virginianus*	6
Screech owl	*Otus asio*	3
Spectacled owl	*Pulsatrix perspicillata*	1
Malay fishing owl	*Ketupa ketupu*	2
Snowy owl	*Nyctea nyctea*	4
Barred owl	*Strix varia*	16
Burrowing owl	*Speotyto cunicularia hypugaea*	3
Nepal brown wood owl	*Strix newarensis*	1
Short-eared owl	*Asio flammeus*	1
Saw-whet owl	*Aegolius acadicus*	2
COLIIFORMES		
Coliidae:		
Mousebird	*Colius striatus*	1

TROGONIFORMES

Family and common name	*Scientific name*	*Number*
Trogonidae:		
Cuban trogan	*Priotelus temnurus*	2

CORACIIFORMES

Alcedinidae:		
Kookaburra	*Dacelo gigas*	8
Coraciidae:		
Lilac-breasted roller	*Coracias caudata*	2
Indian roller	*Coracias benghalensis*	2
Bucerotidae:		
Pied hornbill	*Anthrococeros malabaricus*	1
Concave casqued hornbill	*Buceros bicornis*	1
Abyssinian ground hornbill	*Bucorvus abyssinicus*	1
Gray hornbill	*Tockus birostris*	2
Great black casqued hornbill	*Ceratogymna atrata*	1
Malayan hornbill	*Aceros undulatus*	1
Crowned hornbill	*Tockus alboterminatus*	1
Yellow-billed hornbill	*Tockus flavirostris*	1

PICIFORMES

Capitonidae:		
Asiatic great barbet	*Megalaima virens*	1
Crimson-breasted or coppersmith barbet	*Megalaima haemacephala*	1
Toucan barbet	*Semnornis ramphastinus*	1
Ramphastidae:		
White-lined toucanet	*Aulacorhynchus albivittatus*	2
Sulphur-breasted toucan	*Ramphastos carinatus*	1
White-and-sulphur-breasted toucan	*Rhamphastos vitellinus*	1
Ariel toucan	*Ramphastos ariel*	1
Cuvier's toucan	*Ramphastos cuvieri*	1
Picidae:		
Golden-backed woodpecker	*Brachypternus benghalensis*	2
Scaly-bellied woodpecker	*Picus squamatus*	1

PASSERIFORMES

Tyrannidae:		
Eastern kingbird	*Tyrannus tyrannus*	1
Pittidae:		
Indian pitta	*Pitta brachyura*	1
Alaudidae:		
Horned lark	*Eremophila alpestris*	2
Corvidae:		
Magpie	*Pica pica*	5
Yellow-billed magpie	*Pica nuttalli*	1
Asiatic tree pie	*Crypsirina formosae*	2
Magpie jay	*Calocitta formosa*	1
Blue jay	*Cyanocitta cristata*	3
Steller's jay	*Cyanocitta stelleri*	4
European jay	*Garrulus glandarius*	2
African white-necked crow	*Corvus albus*	2
American crow	*Corvus brachyrhynchos*	3
Raven	*Corvus corax*	2

Family and common name	*Scientific name*	*Number*
Corvidae—Continued		
Indian crow	*Corvus splendens*	1
Formosan red-billed pie	*Cissa caerulea*	6
Occipital blue pie	*Cissa occipitalis*	1
Hunting crow	*Cissa chinensis*	3
Inca jay	*Xanthoura yncas*	1
Cracticidae:		
White-backed piping crow	*Gymnorhina hypoleuca*	1
Paridae:		
Red-headed tit	*Aegithaliscus concinnus*	1
Great tit	*Parus major*	1
Gray tit	*Parus major*	3
Tufted titmouse	*Parus bicolor*	3
Chickadee	*Parus atricapillus*	1
Yellow-cheeked tit	*Parus xanthogenys*	1
Sittidae:		
Chestnut-bellied nuthatch	*Sitta castanea*	1
Timaliidae:		
White-crested laughing thrush	*Garrulax bicolor*	4
Tit-babbler	*Yuhina flavicollis*	1
Black-headed sibia	*Heterophasia capistrata*	2
Silver-eared mesia	*Mesia argentauris*	6
Pekin robin	*Liothrix luteus*	4
White-capped redstart	*Chaimarrhornis leucocephalus*	2
Pycnonotidae:		
Red-eared bulbul	*Pycnonotus jocosus*	1
Black-headed bulbul	*Pycnonotus atriceps*	3
Red-vented bulbul	*Pycnonotus cafer*	5
White-cheeked bulbul	*Pycnonotus leucogenys*	6
White-eared bulbul	*Pycnonotus leucotis*	1
Troglodytidae:		
Carolina wren	*Thryothorus ludovicianus*	1
Mimidae:		
Mockingbird	*Mimus polyglottos*	1
Catbird	*Dumetella carolinensis*	3
Turdidae:		
Robin, albino	*Turdus migratorius*	1
European song thrush	*Turdus ericetorum*	2
Blackbird	*Turdus merula*	2
Cliff chat	*Thamnolaea cinnamoneiventris*	1
Motacillidae:		
White wagtail	*Motacilla alba*	2
Sturnidae:		
Rose-colored pastor	*Pastor roseus*	1
Purple starling	*Lamprocolius purpureus*	3
Burchell's long-tailed starling	*Lamprotornis caudatus*	1
Amethyst starling	*Cinnyricinchus leucogaster*	1
Tricolored starling	*Spreo superbus*	1
Starling	*Sturnus vulgaris*	2
Jungle mynah	*Acridotheres tristis*	1
Lesser hill mynah	*Gracula religiosa indica*	1
Greater Indian hill mynah	*Gracula religiosa intermedia*	2

Family and common name	*Scientific name*	*Number*
Nectariniidae:		
Scarlet-chested sunbird	*Chalcomitra rubescens*	1
Eastern double-collared sunbird	*Cinnyris mediocris*	2
Variable sunbird	*Cinnyris venustus*	2
Scarlet-tufted malachite sunbird	*Nectarinia johnstoni*	2
Beautiful sunbird	*Nectarinia pulchella*	1
Tecasse sunbird	*Nectarinia tacazze*	1
Zosteropidae:		
White-eye	*Zosterops palpebrosa*	8
Coerebidae:		
Black-headed sugarbird	*Chlorophanes spiza*	2
Purple sugarbird	*Cyanerpes coerulea*	4
Blue or yellow-winged sugarbird	*Cyanerpes cyaneus*	4
Bananaquit	*Coereba flaveola*	1
Parulidae:		
Ovenbird	*Seiurus aurocapillus*	1
Ploceidae:		
Red-naped widowbird	*Coliuspasser laticauda*	10
Giant whydah	*Diatropura procne*	1
Baya weaver	*Ploceus baya*	3
Vitelline masked weaver	*Ploceus vitellinus*	3
Mahali weaver	*Ploceipasser mahali*	1
Red bishop weaver	*Euplectes orix*	1
Yellow-crowned bishop weaver	*Euplectes afra*	2
White-headed nun	*Lonchura maja*	4
Bengalese finch	*Lonchura* sp.	6
Cut-throat weaver finch	*Amadina fasciata*	1
Lavender finch	*Estrilda coerulescens*	2
Strawberry finch	*Estrilda amandava*	5
Red-eared waxbill	*Estrilda astrild*	1
Common waxbill	*Estrilda troglodytes*	1
Zebra finch	*Poephila castanotis*	13
Gouldian finch	*Poephila gouldiae*	1
Java finch	*Padda oryzivora*	8
Icteridae:		
Yellow-headed marshbird	*Xanthocephalus xanthocephalus*	1
Rice grackle	*Psomocolax oryzivora*	1
Purple grackle	*Quiscalus quiscula*	12
Swainson's grackle	*Holoquiscalus lugubris*	1
Boat-tailed grackle	*Megaquiscalus major*	2
Glossy cowbird	*Molothrus bonariensis*	3
Brown-headed cowbird	*Molothrus ater*	2
Bay cowbird	*Molothrus badius*	2
Colombian red-eyed cowbird	*Tangavius armenti*	1
Red-winged blackbird	*Agelaius phoeniceus*	4
Red-breasted marshbird	*Leistes militaris*	10
Troupial	*Icterus icterus*	2
Crested oropendola	*Xanthornus decumanus*	1
Thraupidae:		
Blue tanager	*Thraupis cana*	1
White-edged tanager	*Thraupis leucoptera*	2
Violet tanager	*Euphonia violacea*	2

Family and common name	*Scientific name*	*Number*
Thraupidae—Continued		
Black-and-white tanager	*Cissopis leveriana*	1
Yellow-rumped tanager	*Ramphocelus icteronotus*	1
Passerini's tanager	*Ramphocelus passerinii*	1
Red tanager	*Piranga rubra*	1
Fringillidae:		
Rice grosbeak	*Oryzoborus crassirostris*	1
Evening grosbeak	*Hesperiphona vespertina*	6
Brazilian cardinal	*Paroaria cucullata*	1
Black-throated cardinal	*Paroaria gularis*	7
Black-eared cardinal	*Paroaria gularis nigro*	2
Cardinal	*Richmondena cardinalis*	3
European linnet	*Carduelis cannabina*	6
European goldfinch	*Carduelis carduelis*	3
European goldfinch X canary, hybrid	*Carduelis carduelis* X *Serinus canarius*	1
Canary	*Serinus canarius*	2
Green finch	*Chloris chloris*	2
Lesser yellow finch	*Sicalis luteola*	2
Saffron finch	*Sicalis flaveola*	6
White-lined finch	*Spermophila lineola*	5
European bullfinch	*Pyrrhula pyrrhula*	2
Melodious grassquit	*Tiaris canora*	1
Chaffinch	*Fringilla coelebs*	1
Slate-colored junco	*Junco hyemalis*	1
Buff-throated saltator	*Saltator maximus*	1
Tawny-bellied seedeater	*Sporophila minuta*	7
Song sparrow	*Melospiza melodia*	1
Dickcissel	*Spiza americana*	5
White-throated sparrow	*Zonotrichia albicollis*	1
White-crowned sparrow	*Zonotrichia leucophrys*	2
Yellowhammer	*Emberiza citrinella*	1
European bunting	*Emberiza calandra*	2
Jacarini finch	*Volatinia jacarini*	3
Tropical seed finch	*Oryzoborus torridus*	3

REPTILES

LORICATA

Alligatoridae:		
Caiman	*Caiman sclerops*	2
Black caiman	*Melanosuchus niger*	8
American alligator	*Alligator mississipiensis*	9
Chinese alligator	*Alligator sinensis*	2
Crocodilidae:		
Broad-nosed crocodile	*Osteolaemus tetraspis*	2
African crocodile	*Crocodylus niloticus*	2
Narrow-nosed crocodile	*Crocodylus cataphractus*	1
Salt-water crocodile	*Crocodylus porosus*	1
American crocodile	*Crocodylus acutus*	2
Gavialidae:		
Indian gavial	*Gavialis gangeticus*	1

CHELONIA

Family and common name	*Scientific name*	*Number*
Chelydridae:		
Snapping turtle	*Chelydra serpentina*	Many
Alligator snapping turtle	*Macrochelys temminckii*	1
Kinosternidae:		
Musk turtle	*Sternotherus odoratus*	3
Mud turtle	*Kinosternon subrubrum*	7
South American mud turtle	*Kinosternum cruentatum*	2
Emydidae:		
Box turtle	*Terrapene carolina*	Many
Three-toed box turtle	*Terrapene c. triunguis*	2
Ornate box turtle	*Terrapene ornata*	1
Florida box turtle	*Terrapene bauri*	1
Kura kura box turtle	*Cuora amboinensis*	2
Diamondback turtle	*Malaclemys terrapin*	3
Map turtle	*Graptemys geographica*	2
False map turtle	*Graptemys pseudogeographica*	2
Barbour's map turtle	*Graptemys barbouri*	4
Painted turtle	*Chrysemys picta*	Many
Western painted turtle	*Chrysemys picta belli*	15
Cumberland turtle	*Pseudemys scripta troostii*	23
South American red-lined turtle	*Pseudemys scripta callirostris*	2
Yellow-bellied turtle	*Pseudemys scripta scripta*	15
Red-bellied turtle	*Pseudemys rubriventris*	10
Red-eared turtle	*Pseudemys scripta elegans*	12
Southern water turtle	*Pseudemys floridana*	17
Florida red-bellied turtle	*Pseudemys nelsoni*	2
Central American turtle	*Pseudemys ornata*	2
Cuban water turtle	*Pseudemys decussata*	1
Chicken turtle	*Deirochelys reticularia*	1
Spotted turtle	*Clemmys guttata*	4
Wood turtle	*Clemmys insculpta*	6
Iberian pond turtle	*Clemmys leprosa*	2
European pond turtle	*Emys orbicularis*	3
Blanding's turtle	*Emys blandingii*	2
Reeve's turtle	*Chinemys reevesii*	4
Testudinidae:		
Giant Aldabra tortoise	*Testudo elephantina*	2
Galápagos tortoise	*Testudo vicina*	2
Duncan Island tortoise	*Testudo ephippium*	2
South American tortoise	*Testudo tabulata*	1
Star tortoise	*Testudo elegans*	2
European tortoise	*Testudo graeca*	1
Pelomedusidae:		
African water turtle	*Pelomedusa subrufa*	2
African black mud turtle	*Pelusios nigricans*	1
Amazon spotted turtle	*Podocnemis unifilis*	2
Chelydidae:		
South American side-necked turtle	*Batrachemys nasuta*	2
Australian side-necked turtle	*Chelodina longicollis*	3
Small side-necked turtle	*Hydromedusa tectifera*	2
Large side-necked turtle	*Phrynops hilarii*	8
Krefft's turtle	*Emydura krefftii*	3

Family and common name	*Scientific name*	*Number*
Chelydidae—Continued		
Murray turtle	*Emydura macquarrii*	3
South American gibba turtle	*Mesoclemmys gibba*	2
Flat-headed turtle	*Platemys platycephala*	3
Trionychidae:		
Southern soft-shelled turtle	*Trionyx ferox*	5
African soft-shelled turtle	*Trionyx triunguis*	2
SAURIA		
Gekkonidae:		
Giant gecko	*Gekko stentor*	1
Nelson's gecko	*Aristelliger nelsoni*	1
Banded gecko	*Coleonyx variegatus*	1
Iguanidae:		
Common iguana	*Iguana iguana*	3
Carolina anole	*Anolis carolinensis*	Many
Nelson's anole	*Anolis nelsoni*	1
Giant anole	*Anolis equestris*	1
Texas horned lizard	*Phrynosoma cornutum*	1
Crested lizard	*Leiocephalus varius*	3
Blue scaly lizard	*Sceloporus cyanogenys*	1
Fence lizard	*Sceloporus undulatus*	2
Spiny-tailed iguana	*Ctenosaura acanthura*	1
Scincidae:		
Mourning skink	*Egernia luctuosa*	2
White's skink	*Egernia whitei*	4
Greater five-lined skink	*Eumeces fasciatus*	1
Broad-headed skink	*Eumeces laticeps*	1
Great plains skink	*Eumeces obsoletus*	1
Sand skink	*Scincus officinalis*	4
Stump-tailed skink	*Tiliqua rugosa*	1
Malayan skink	*Mabuya multifasciata*	2
Gerrhosauridae:		
Plated lizard	*Gerrhosaurus major*	1
Teiidae:		
Black tegu	*Tupinambis nigropunctatus*	1
Varanidae:		
Dumeril's monitor	*Varanus dumerili*	1
Indian monitor	*Varanus flavescens*	1
Malayan monitor	*Varanus salvator*	1
Indian monitor	*Varanus bengalensis*	1
Pakistan monitor	*Varanus griseus*	2
Australian lace monitor	*Varanus varius*	3
Helodermatidae:		
Mexican beaded lizard	*Heloderma horridum*	1
Beaded lizard (black phase)	*Heloderma horridum*	1
Gila monster	*Heloderma suspectum*	1
Anguidae:		
Glass lizard	*Ophisaurus ventralis*	3
SERPENTES		
Boidae:		
Anaconda	*Eunectes murinus*	1
Tree boa	*Boa enydris enydris*	1
Cook's tree boa	*Boa enydris cooki*	6

Family and common name	*Scientific name*	*Number*
Boidae—Continued		
Boa constrictor	*Constrictor constrictor*	1
Emperor boa	*Constrictor imperator*	1
Cuban ground boa	*Tropidophis melanura*	1
Rainbow boa	*Epicrates cenchria*	4
Cuban tree boa	*Epicrates angulifer*	3
Ball python	*Python regius*	1
Indian rock python	*Python moluras*	2
Regal python	*Python reticulatus*	1
Colubridae:		
Water snake	*Natrix sipedon*	2
European grass snake	*Natrix natrix*	1
Diamond-backed water snake	*Natrix rhombifera*	1
Red-bellied water snake	*Natrix erythrogaster*	1
Island water snake	*Natrix insularum*	1
Mangrove snake	*Natrix compressicauda*	1
Florida green water snake	*Natrix cyclopion floridana*	1
Queen snake	*Natrix septemvitta*	2
Garter snake	*Thamnophis sirtalis sirtalis*	3
Ribbon snake	*Thamnophis sauritus*	6
Ring-necked snake	*Diadophis punctatus edwardsii*	1
Black racer	*Coluber constrictor constrictor*	5
Red racer	*Masticophis flagellum*	1
Asiatic rat snake	*Elaphe taeniura*	1
Lesser Indian rat snake	*Elaphe carinata*	1
Pilot black snake	*Elaphe obsoleta obsoleta*	3
Pilot black snake (albino)	*Elaphe obsoleta obsoleta*	1
Fox snake	*Elaphe vulpina*	2
Corn snake	*Elaphe obsoleta guttata*	2
Lindheimer's rat snake	*Elaphe obsoleta lindheimeri*	1
Chicken snake	*Elaphe quadrivittata*	1
Aesculapian snake	*Elaphe longissima*	1
King snake	*Lampropeltis getulus getulus*	1
Speckled king snake	*Lampropeltis getulus holbrooki*	3
California king snake	*Lampropeltis getulus californiae*	2
Sonoran king snake	*Lampropeltis getulus splendida*	1
Scarlet king snake	*Lampropeltis triangulum doliata*	1
Milk snake	*Lampropeltis triangulum*	1
Tropical king snake	*Lampropeltis polyzonus*	1
Mole snake	*Lampropeltis rhombomculata*	1
Cat-eye snake	*Leptodeira annulata*	1
Eastern worm snake	*Carphophis amoenus*	1
DeKay's snake	*Storeria dekayi*	1
Green whip snake	*Dryophis prasinus*	1
File snake	*Simocephalus capensis*	1
Wolf snake	*Lycodon flavomaculatus*	2
Green-headed tree snake	*Leptophis mexicanus*	1
Elapidae:		
Indian cobra	*Naja naja*	2
Taiwan cobra	*Naja naja atra*	7
Egyptian cobra	*Naja haje*	1
Krait	*Bungarus multicinctus*	1

Family and common name	*Scientific name*	*Number*
Acrochordidae:		
Elephant trunk snake	*Acrochordus javanicus*	1
Crotalidae:		
Southern copperhead	*Ancistrodon contortrix contortrix*	1
Northern copperhead	*Ancistrodon controtrix mokeson*	2
Western broad-banded copperhead	*Ancistrodon contortrix laticinctus*	1
Water moccasin, or cottonmouth	*Ancistrodon piscivorus*	3
Mamushi	*Ancistrodon halys blomhoffi*	1
Asian snorkel viper	*Ancistrodon acutus*	2
Green palm viper	*Trimeresurus gramineus*	2
Stejneger's palm viper	*Trimeresurus stejnegeri*	1
Wagler's pit viper	*Trimeresurus wagleri*	1
Mamushi, or Asiatic viper	*Trimeresurus elegans*	1
Habu, or Asiatic viper	*Trimeresurus flavoviridis*	1
Southern Pacific rattlesnake	*Crotalus viridis helleri*	1
Prairie rattlesnake	*Crotalus viridis viridis*	1
Western diamondback rattlesnake	*Crotalus atrox*	24
Timber rattlesnake	*Crotalus horridus*	2

AMPHIBIANS

CAUDATA

Amphiumidae:		
Congo eel	*Amphiuma means*	1
Cryptobranchidae:		
Hellbender	*Cryptobranchus alleganiensis*	2
Ambystomidae:		
Spotted salamander	*Ambystoma maculatum*	2
Jefferson's salamander	*Ambystoma jeffersonianum*	1
Salamandridae:		
Red-bellied newt	*Cynops pyrrhogaster*	10
Red-spotted newt	*Diemictylus viridescens*	19

SALIENTIA

Bufonidae:		
American toad	*Bufo americanus*	1
Giant toad	*Bufo marinus*	5
Cuban toad	*Bufo peltocephalus*	6
Oak toad	*Bufo quercicus*	2
Pelobatidae:		
Spadefoot toad	*Scaphiopus holbrooki*	14
Pipidae:		
Surinam toad	*Pipa pipa*	14
African clawed frog	*Xenopus laevis*	5
Leptodactylidae:		
Colombian horned frog	*Ceratophrys calcarata*	2
Argentine horned frog	*Ceratophrys ornata*	1
Hylidae:		
Barking tree frog	*Hyla versicolor*	2
Green tree frog	*Hyla cinerea*	4
Cuban tree frog	*Hyla septentrionalis*	4
Squirrel tree frog	*Hyla squirella*	1
Gray tree frog	*Hyla versicolor*	2

Family and common name	*Scientific name*	*Number*
Microhylidae:		
Great Plains narrow-mouthed toad	*Microhyla olivacea*	1
Ranidae:		
African bull frog	*Rana adspersa*	4
American bull frog	*Rana catesbeiana*	1
Green frog	*Rana clamitans melanota*	5
Leopard frog	*Rana pipiens*	Many
ARTHROPODS		
DECAPODA		
Cenobitidae:		
Land hermit crab	*Coenobita clypeatus*	Many
ARANEIDA		
Theridiidae:		
Black-widow spider	*Latrodectus mactans*	1
ORTHOPTERA		
Blattidae:		
Tropical giant cockroach	*Blaberus giganteus*	Many
MOLLUSKS		
PULMONATA		
Planorbidae:		
Pond snail	*Helisoma trivolvis*	Many
FISHES		
NEOCERATODONTOIDEI		
Protopteridae:		
African lungfish	*Protopterus annectens*	2
OSTARIOPHYSOIDEI		
Characidae:		
Piranha	*Serrasalmus niger*	1
Metynnis	*Metynnis rooseveltii*	1
Black tetra	*Gymnocorymbus ternetzi*	3
Cyprinidae:		
Zebra fish	*Brachydanio rerio*	3
Clown barb	*Barbus everetti*	1
Tiger barb	*Puntius partipentazona*	2
White Cloud Mountain fish	*Tanichthys albonubes*	15
Electrophoridae:		
Electric eel	*Electrophorus electricus*	1
CYRINODONTOIDEI		
Poeciliidae:		
Flag-tailed guppy	*Lebistes reticulatus*	10
Guppy	*Lebistes reticulatus*	15
Black mollie	*Mollienesia latipinna*	2
Platy, or moonfish	*Xiphophorus maculatus*	1

PERCOMORPHOIDEI

Family and common name	*Scientific name*	*Number*
Anabantidae:		
Climbing perch	*Anabas testudineus*	3
Cichlidae:		
Peacock cichlid	*Astronotus ocellatus*	1
Egyptian mouthbreeder	*Haplochromis multicolor*	3
African mouthbreeder	*Pelmatochromis guentheri*	2
Angelfish	*Pterophyllum eimekei*	2
Jack Dempsey fish	*Cichlasoma biocellatum*	15
Jewelfish	*Hemichromis bimaculatus*	1
Lorcariidae:		
South American catfish	*Plecostomus plecostomus*	2

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 1961 totaled $1,304,000, which was $138,800 more than for the fiscal year 1960. The increase consisted of $22,000 to cover salary increases for General Schedule employees in accordance with Public Law 86–568; $16,000 to cover salary increases for police employees in accordance with Public Law 86–379; $25,800 to cover salary increases for Wage Board employees; $12,900 for within-grade salary advancements for both General Schedule and Wage Board employees; $8,500 for Federal Employees Health Benefits; $46,100 to establish 11 new positions; $7,500 for the purchase of new equipment.

Of the total appropriation, 83.5 percent ($1,089,002) was used for salaries and related personnel costs and 16.5 percent ($214,998) for the maintenance and operation of the Zoo. Included in the latter figure were $74,000 for animal food; $18,000 for fuel for heating; $34,257 for materials for building construction and repairs; $9,725 for the purchase of animals; $9,600 for electricity; $5,400 for telephone, postal, and telegraph services; and $5,000 for veterinarian equipment and supplies. The balance of $35,675 in operational funds was expended for other items, including freight, sundry supplies, uniforms, gasoline, road repairs, equipment replacement, and new equipment.

In addition to the regular appropriation, $240,000 for safety improvements was appropriated for capital outlay. This was to carry out the second phase of the safety program.

PERSONNEL

On October 10, 1960, Dr. William M. Mann, Director of the National Zoological Park from 1925 until 1956, died at the age of 74. During his regime he had built up the collection of animals from about 1,600 to more than 3,000 specimens; he had supervised the build-

ing of modern quarters for birds, reptiles, large mammals, and small mammals, as well as of machine shops, the Zoo restaurant, and police headquarters. He led numerous expeditions to South America, Indonesia, and Africa to collect animals for the Zoo. It was during his tenure of office that the National Zoological Park grew from a second-rate Zoo to one of world-wide importance.

Russell Morrison, supervisory keeper, came to the Zoo March 1, 1931, and was assigned to the reptile house. He died of a heart attack while on duty August 14, 1960.

Malcolm Davis, who first came to the Zoo on November 16, 1927, retired on July 1, 1960, to accept a research position in private industry. He had for many years been in charge of the bird house and was associate head keeper at the time of his retirement. He had been on many expeditions to collect animals, including three voyages to Antarctica to bring back penguins.

Other retirements were those of Bertelle Ford, keeper, employed at the Zoo from December 5, 1942, to October 31, 1960; Leonard Ford, supervisory animal keeper, December 29, 1950, to June 15, 1961; William G. Modena, December 16, 1936, to July 31, 1960, assistant superintendent of maintenance and construction; Charles Dean, operating engineer, August 16, 1927, to December 31, 1960; and Ada McNeil, custodial laborer, from November 10, 1952, to July 31, 1960.

Reily Straw, a welder, was promoted to take Mr. Modena's place as assistant superintendent of maintenance and construction. Donald Swartzback of the grounds department was made supervisor of the new tree section.

A night-keeper program was initiated this year to insure care of the animals 24 hours a day. This is essential particularly in the case of baby animals that are being hand fed or sick animals that need medication during the night.

In fiscal year 1961 there were 197 authorized positions at the Zoo, divided as follows: Administrative office, 16; animal department, 76, an increase of 6 over the previous year (2 night keepers, 2 commissary stewards, 2 laborers); mechanical department, 61; police department, 33, an increase of 3; and grounds department, 11, an increase of 2.

Mrs. Fruza C. Kussrow was appointed budget analyst on July 18, 1960, and Frank Maloney came in as engineer on April 16, 1961.

FRIENDS OF THE NATIONAL ZOO

"Friends of the National Zoo," a group of civic-minded District residents, were active again this year. On December 16, 1960, John Perry, president of the organization, presented to the Smithsonian Institution a "master plan" which had been made by Meade Palmer and Morris Trotter, landscape architects. This substitutes a pedestrian "greenway" for the dangerous automobile road that now goes

through the center of the Zoo and suggests locations for new buildings such as a new monkey house, monkey island, lion house, hoofed-stock complex, administration building, and auditorium. Dr. Carmichael presented the master plan to the Board of Regents at their annual meeting in January 1961.

The "Friends" were responsible for a brass plaque which was placed at the base of the flag that flies at the Connecticut Avenue entrance to the Zoo. This flagpole was dedicated in September 1959, "as an expression of warm affection for Dr. William M. Mann, former Director of the Zoo," and on the day of Dr. Mann's funeral the flag was flown at half-staff.

June 5, 1961, was designated as Zoo Night for the "Friends." About 200 of them gathered at the Police Station at 8 p.m. and were taken on a conducted tour.

INFORMATION AND EDUCATION

The Zoo continues to handle a large correspondence with persons all over the world and from every part of this country, who write to the Zoo, as a national institution, for information regarding animals. Telephone calls come in constantly asking for identification of animals, proper diets, or treatment of disease. Visitors to the office as well as to the animal exhibits are constantly seeking information.

On his trip to India for the white tiger, the Director had an opportunity to visit zoos in Hawaii, Japan, the Philippines, Malaya, and Thailand, as well as India, and to photograph various types of new construction and design. He has lectured on these Oriental zoos to civic and scientific groups. His article on "Enchantress, the White Tiger" was published in the National Geographic Magazine for May 1961.

J. Lear Grimmer, Associate Director, continued his fieldwork in British Guiana and spent 7 weeks there studying the life history of the hoatzin. For 2 weeks he was joined by William Widman, senior keeper. Mr. Grimmer left again for British Guiana in June 1961, accompanied by Keeper Charles Hall.

The Director and Travis E. Fauntleroy, Jr., assistant to the Director, attended the annual convention of the American Association of Zoological Parks and Aquariums at Long Beach, Calif., in September 1960. Mr. Fauntleroy stopped at Brookfield (Chicago), San Francisco, San Diego, and San Antonio to study management methods in these well-known zoos. The Director visited Vancouver, B.C., Seattle, Wash., Portland, Oreg., San Francisco, and San Diego, studying recent construction at these zoos. In February, the Director and Dr. James F. Wright attended the Midwinter Conference of Midwest Zoo Directors in St. Louis, where the Director presented a paper on Oriental Zoos and Dr. Wright spoke on the immobilization of animals.

In Washington, the Director spoke on three radio programs and appeared on television, showing a number of Zoo animals.

Senior Keeper William F. Widman and Supervisory Keeper Holmes M. Vorous have written an article on the hatching of kookaburras in the Zoo, which will be published in England by Avicultural Magazine in the autumn of 1961.

Senior Keeper Mario DePrato and Holmes M. Vorous accompanied a shipment of live reptiles to the Detroit Zoo in August 1960, arriving there in time for the opening of the new reptile house. While in the Midwest they visited zoos in Toledo, Cleveland, and Pittsburgh, studying methods of exhibiting and handling animals.

Ordinarily the Zoo does not conduct guided tours of the Park, but exceptions were made for a group of children from the Columbia Lighthouse for the Blind and for four other groups of handicapped children.

On July 14, 1960, 1,523 foreign exchange students visited the Zoo; the schoolboy patrol, consisting of 9,740 students from all parts of the country, came to the Park on May 13, 1961; and a group of African students toured the Park on June 21, 1961.

While the Zoo does not conduct a regular research program as such, effort is made to study the animals and improve their health, housing, and diet in every way possible.

REPORT OF THE VETERINARIAN

The veterinarian, Dr. James F. Wright, reports that the major veterinary problems at the National Zoological Park for this year, as in past years, stem from the lack of facilities and help to investigate disease in the collection, absence of suitable hospitalization and quarantine, and the need for a full-time arrangement for orphan-animal care.

The central nervous system disease of monkeys mentioned in last year's report is still under investigation by the Armed Forces Institute of Pathology. Necropsies have been performed on seven monkeys which during life had shown the typical signs of acute amaurotic epilepsy as described by Langdon and Cadwallader in 1915 and again by Van Bogaert and Scherer in 1935. These cases include two immature Barbary apes (died January 5, 1960, and April 8, 1961), an immature pig-tailed macaque (July 20, 1959), an immature hybrid (Philippine x Javan) macaque (January 6, 1960), an immature drill (April 9, 1960), an immature mandrill (June 24, 1960), and an immature hybrid gibbon (*Hylobate lar* x *H.* sp.) which was raised in a keeper's home from the day of birth and was thus rather free of the Park environment. Three monkeys in the collection, a gray-cheeked mangabey, a black-crested mangabey, and a mandrill, all female

adults, have the typical seizures of this malady periodically but act normal in every way except during the attacks. The black-crested mangabey is, as nearly as can be determined, blind without obvious gross defect in either eye. For almost a year, these three animals have received daily doses of diphenylhydantoin sodium, which apparently has suppressed the occurrence and severity of the seizures to a minor degree. Ingestion of toxic quantities of lead has always been considered a strong possibility in causing this condition, but it has been determined that no lead-base paints have been used in the animal areas, and an analysis of the water supply at the monkey house disclosed less than acceptable minimums of this element.

A maned wolf (*Chrysocyon jubatus*), received from a dealer in South America, died after a short illness in February 1961. The only antemortem signs were inappetence and inanition leading to a comatose state on the day before death. Antibiotics, canine antidistemper serum, and intravenous therapy were without observable effect. A necropsy performed immediately after death by the Pathology Institute disclosed the following conditions: heartworm (*Dirofilaria* sp.), lungworm (*Filaroides osleri*), and hookworm infestations; presence of the giant kidney worm (*Dioctophyma renale*); parasitic nodules of *Spirocerca lupi* in the aorta and other great vessels; large ulcerated areas in the stomach; and negri bodies of rabies in microscopic preparations of brain tissue. Just prior to death blood samples were taken from this animal for blood-picture study and serology. The interesting finding of these studies was the presence of serum antibodies to the disease caused by *Leptospira canicola*. The serum titre was a very high 1:6400.

A female maned wolf, which was obtained from the same source in January 1960, died in August 1960, with the same antemortem signs. The necropsy report describes only an infestation with the lungworm *Filaroides osleri*. The central nervous system of this individual was not examined because the carcass was requested for the U.S. National Museum.

Juvenile osteoporosis occurred in a pair of bobcats and a mountain lion, all being raised with the parents and all showing similar signs of onset-lameness in one hind limb progressing to severe lameness and ultimately posterior paralysis. Radiographs taken of one of the bobcats showed a fracture of the femur, a folding fracture of the pelvis, and collapse of the lumbar vertebrae with resultant compression of the spinal cord. Necropsy reports by Dr. Wayne Riser established the condition as juvenile osteoporosis. For future cases he recommended the addition of potassium iodide to the ration as well as increased calcium and vitamin D (one-half teaspoonful daily of a solution of 50 mg. KI to 100 cc. of water).

609118—61——13

In the report for 1960 it was stated that attempts were being made to develop a diagnostic test for tuberculosis in wild hoofed animals through serum antibodies. Blood samples were obtained from two elands and a giraffe suspected of being infected with this disease. These samples were checked serologically by investigators of the Department of Agriculture, whose preliminary report indicated that no specific antibodies for the tuberculosis antigen were present in the serums of these animals. Since the samples were examined, all three animals have died with the necropsy diagnosis of pulmonary tuberculosis. These pathological findings have been supported by reports from Dr. Alfred G. Karlson of the Mayo Foundation, who isolated and identified the bovine variety of the tuberculosis organism from tissues of these animals.

A lammergeyer, or bearded vulture (*Gypaetus barbatus*), which was acquired from a dealer in West Germany in June 1960, developed wartlike lesions on both feet after one month in the collection. In two more days similar lesions were noticed on the lower lid of the right eye. The left eyelid became involved in another three weeks. The growths were fleshy in nature with no vesicle formation noted, although there did appear to be some secondary infection and discharge from the sites. Except for an erratic appetite, which may have been caused by shipment, it was not apparent that this condition had any general debilitating effect on the bird. The largest growth was easily removed from the eyelid for pathological examination; the smaller "nodules" all dropped off after three or four weeks. As this bird was returning to normal, similar lesions were noticed on a king penguin. Again the condition occasioned the bird no distress and disappeared in about one month. While the penguin was recovering, a black-footed albatross developed some nodules in and around the beak which disappeared in about six weeks. Finally an Adélie penguin was found with numerous growths around the beak and eyelids. Whereas the aforementioned birds recovered, this penguin died before the lesions had disappeared. The pathologists found pathognomonic evidence of fowl-pox infection in this penguin and in the tissue submitted from the lammergeyer vulture. It is probable that the virus was introduced from the vulture brought from overseas by air shipment. The black-footed albatross and the king penguin are also presumed to have been infected with this virus. There has been no subsequent appearance of this condition to date.

Two three-toed sloths (*Bradypus tridactylus*) were acquired during the past year from South America: a male, which lived only four days after arriving in poor condition, and a female, which lived from September until February 1961 and produced a baby, which lived for 14 days. Both the adult sloths had severe anemias and bone marrow hypoplasia, according to the pathologists' report.

A female spotted hyaena died May 12, 1961. No report has come in as yet from the AFIP except that the animal had mammary tumors. Both this hyaena and the male, which died in 1960, were received at the Park July 1, 1947.

The use of the intramuscular, long-acting barbiturate "Capchur-barb" was continued, both in the projectile syringe and by hand syringe. Among the animals requiring sedation or anesthesia with this drug were two American alligators, an eland antelope, a pronghorn antelope, zebu cow, American elk, raccoon, bighorn sheep, puma, capuchin monkey, Java macaque, lesser panda, and Grevy's zebra. Another anesthetic preparation that was found most useful was the rectal thiopental sodium (Pentothal-Abbott). This drug is packaged in disposable plastic syringes for immediate use with a graduated plunger and two separate applicators per syringe. This type of sedation or anesthesia was used for short procedures and for restraint on primates and carnivores.

Dr. Wright made two trips to a game farm in Florida and one to the quarantine station in New Jersey at the request of the Department of Agriculture for the purpose of immobilizing captive wild animals with the projectile syringe method. The drug used in these immobilizations was succinylcholine chloride, with one exception described below. The list of animals successfully immobilized with succinylcholine includes 23 Grant's zebra, 11 Grevy's zebra, 8 Damara zebra, 17 eland, 4 greater kudu, 4 beisa oryx, 2 blackbuck, 2 aoudad, 1 hartebeest, 1 brindled gnu, 3 nilghai, 1 American bison, 3 red deer, 1 giraffe, 1 spotted hyaena, and 1 white-handed gibbon. In addition to these, 5 white-tailed gnus were immobilized with the drug gallamine triethiodide (Flaxedil-Lederle). On the basis of reports received from investigators in Africa it seemed that this latter drug was more satisfactory for immobilizing wildebeest. However, both gallamine and succinylcholine have been used successfully in this type of animal. Complete reports on these immobilizations are in preparation.

Dr. Wright's paper "The Immobilization of Captive Wild Animals with Succinylcholine II," prepared in collaboration with Dr. Warren R. Pistey of the New England Institute for Medical Research, was published by the Canadian Journal of Comparative Medicine, vol. 25, No. 3, March 1961.

A demonstration of the use of the projectile syringe was given at the University of Maryland for a combined meeting of the Maryland State Veterinary Medical Association, the District of Columbia Veterinary Medical Association, American Animal Hospital Association, and the District of Columbia Academy of Veterinary Medicine.

Dr. F. R. Lucas, Livestock Sanitary Laboratory, Centreville, Md.,

provided clinical laboratory services including microscopic tissue reports.

Identification of parasites from specimens in the collection were made by M. B. Chitwood and W. W. Becklund of the Parasite Classification and Distribution Investigations, Beltsville Parasitological Laboratory, U.S. Department of Agriculture.

Necropsies of major and important specimens were performed by the pathologists of the Armed Forces Institute of Pathology, Walter Reed Army Medical Center. Necropsy materials not needed by the Institute were offered to Dr. Thomas Peery of the George Washington School of Medicine for comparative pathology study.

Isolations and identifications of suspected tubercular tissues were made by Dr. Karlson of the Mayo Foundation.

Following are the statistics for the mortality rates during the past fiscal year and a table of comparison with the past 6 fiscal years:

Mortality, fiscal year 1961			*Total mortality, past 6 fiscal years*	
	Death	Attrition*		
Mammals	102	32	1956	618
Birds	163	17	1957	549
Reptiles	132	71	1958	550
			1959	472
			1960	532
	397	120	1961	517

* Attrition is the term used for those losses due mainly to the trauma of shipment and handling after accession at the Zoo, or before an animal can adapt to cage habitation within the collection.

The old pair of Nile hippopotamuses, Pinky and Bongo, were "retired" from the Zoo in the summer of 1959 and placed on deposit at a private zoo in Virginia to make room for a younger pair. The male, Bongo, who had come to the Zoo on April 7, 1914, died on December 4, 1959, after 45 years 7 months 27 days in captivity. The female, who was 11 years old when she was obtained on April 25, 1939, died on December 31, 1960.

Other animals that had been in the collection for a relatively long time and died this year were: A kiang (*Equus onager*) received October 14, 1934, died August 16, 1960, after 25 years 10 months 2 days; South American lungfish (*Lepidosiren paradoxa*), received May 6, 1932, died January 18, 1961, after 28 years 8 months and 12 days. An Indian fresh-water turtle (*Batagur baska*) was a very old specimen when it arrived on September 17, 1947. It died May 19, 1961, after 13 years 8 months 2 days. It was the only one in captivity in the United States and probably the oldest specimen of its kind in any zoo.

A horned toad, *Ceratophrys ornata*, collected by Frances Shippen on the National Zoological Park Expedition to Argentina (received

in the Zoo June 27, 1939) is still living. A salt-water crocodile (*Crocodylus porosus*), purchased July 12, 1932, when about 8 years old, is still living and is believed to be the largest in captivity.

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.

In cooperation with the State Department and the White House, the National Zoological Park arranged for the fulfillment of President Eisenhower's promise to General DeGaulle to send him three pronghorn antelopes for the Paris Zoo. The antelopes selected had been in the collection here and were thus accustomed to captivity. They had originally come from the State Fish and Game Department of Montana, which will send replacements to the National Zoological Park. The pronghorns, the only ones in any European zoo, were flown from Andrews Air Force Base on August 2, 1960, on an Air Force C–130 cargo plane. Lt. Col. Perry Penn, 62d Squadron commander, and Capt. Donald Gould, aircraft commander, were in charge, and the Director of the Zoo accompanied the shipment. All arrangements were made at the request of President Eisenhower. In addition, the plane carried two Virginia deer fawns and an assortment of small mammals, birds, and reptiles. The plane stopped at Prestwick, Scotland, and unloaded there two bear cubs, birds, and alligators for the zoos in Edinburgh and Bristol, before continuing on to Orly Field in France.

Through the cooperation of the U.S. Fish and Wildlife Service Senior Keeper William Widman made a number of collecting trips on Chesapeake Bay to secure waterfowl for the Zoo.

Special acknowledgment is due George Kirk and John Pulaski, in the office of the U.S. 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. The animals have been forwarded to Washington without the loss of a single individual.

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. B. C. Swindell 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 United States National Museum. If the Museum does not need them, they are sent on request to reasearch workers in other institutions.

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

Gifts of plants were received from Mount Vernon, the Botanical Gardens, National Bureau of Standards, District of Columbia Waterworks, St. Elizabeth's Hospital, the Naval Observatory, and the Soldiers' Home. A very welcome gift was a 15-by-40-foot greenhouse, from the Bureau of Standards, to supply tropical plants for forage and for planting in indoor cages.

VISITORS

In cooperation with Albert Mindlin and Samuel Rosenthal, analytical statisticians of the Management Office of the District of Columbia, a new method of estimating the visitor attendance is being developed for greater statistical reliability.

Number of bus groups visiting the Zoo in fiscal year 1961

Locality	Number of groups	Number in groups	Locality	Number of groups	Number in groups
Alabama	30	1, 213	Mississippi	14	541
Arizona	1	28	Montana	1	25
Arkansas	2	70	New Hampshire	1	40
California	1	40	New Jersey	12	963
Connecticut	7	259	New Mexico	1	26
Delaware	13	498	New York	269	10, 753
District of Columbia	177	7, 021	North Carolina	218	8, 652
Florida	33	1, 166	Ohio	32	1, 241
Georgia	124	4, 995	Pennsylvania	294	11, 775
Illinois	6	241	Rhode Island	16	604
Indiana	5	200	South Carolina	52	2, 076
Iowa	5	188	Tennessee	52	2, 022
Kansas	2	60	Texas	2	92
Kentucky	16	618	Vermont	1	35
Louisiana	2	90	Virginia	735	29, 449
Maine	2	441	West Virginia	66	2, 352
Maryland	954	38, 159	Wisconsin	5	182
Massachusetts	11	64			
Michigan	9	303	Total	3, 171	118, 043
Minnesota	6	213			

Groups from foreign countries

	Number of groups	Number in groups		Number of groups	Number in groups
Asia	3	150	Haiti	1	58
Ecuador	1	30	Japan	2	70
Exchange students	40	1,523			
Finland	2	80	Total	51	1,966

About 2 p.m. each day the cars then parked in the Zoo are counted and listed according to the State, Territory, 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 the fiscal year 1961 is as follows:

	Percentage		*Percentage*
Maryland	32.3	California	0.7
Virginia	23.2	Connecticut	.7
District of Columbia	21.1	South Carolina	.6
Pennsylvania	3.9	Michigan	.6
New York	2.3	Illinois	.5
North Carolina	1.9	Georgia	.4
Ohio	1.4	Delaware	.4
New Jersey	1.3	Indiana	.4
West Virginia	1.2	Tennessee	.4
Florida	1.1	Texas	.4
Massachusetts	.9		

The remaining 4.3 percent came from other States, Azores, Bahamas, British Columbia, Canada, Canal Zone, Cuba, England, Finland, France, Germany, Guatemala, Japan, Mexico, Newfoundland, Norway, Okinawa, Philippines, Switzerland, and the Virgin Islands.

On the days of even small attendance there are cars parked in the Zoo from at least 15 States, Territories, the District of Columbia, and foreign countries. On average days there are cars from about 22 States, Territories, the District of Columbia, and foreign countries; and during the periods of greatest attendance the cars represent no less than 34 different States, Territories, and countries. Parking spaces in the Zoo now accommodate 1,079 cars when the bus parking place is utilized and 969 cars when it is not used.

POLICE DEPARTMENT

The practice of using men for police duty on a temporary basis during the busy season continues to prove a highly satisfactory ar-

rangement, releasing the regular officers for special details and assignments, as well as patrol duty.

Refresher courses in first-aid training were given by Sgt. A. L. Canter, Pvt. C. S. Grubbs, and Keeper Lester Ratliff.

Sgt. A. L. Canter, Pvts. G. H Adams, M. J. Devlin, Jr., and A. S. Kadlubowski attended an extensive course on the handling of juveniles administered by the Youth Aid Division of the District of Columbia Metropolitan Police Department.

The police force conducted 1,647 investigations of traffic violations, 137 investigations of a general nature, picked up 42 truant children and took appropriate action and returned 269 lost children to their parents or groups. The First Aid Station handled 1,575 cases, mostly for minor injuries. Visitors who stopped in the police headquarters for information numbered 8,202. Eyeglasses and sunglasses found in the Park and unclaimed were turned over to the Society for the Prevention of Blindness, and unclaimed articles of clothing, etc., were given to the Goodwill Industries.

The Mounted Color Guard, now numbering six officers, continued to participate in local parades.

SAFETY SUBCOMMITTEE

Lt. John R. Wolfe is chairman of the National Zoological Park Safety Subcommittee, which consists of Dr. James F. Wright, administration office; Lt. C. E. Brink, police department; Bert J. Barker, animal department; Reily Straw, maintenance and construction; Michael Dubik of the grounds department; and Mrs. W. M. Holden of the Smithsonian Institution as subcommittee secretary. Monthly meetings of the Safety Subcommittee were held to discuss safety measures and make recommendations to the Director.

In addition to the safety manual issued to the animal department in January 1960, a new safety manual for the maintenance and construction department was issued in October 1960, and one for the grounds department in January 1961. A safety manual for the police department is now being printed.

A survey of all Park buildings was conducted on September 27, 1960, by Harold McCoy of the Federal Civil Defense Organization, accompanied by Captain James and Lt. Brink of the Zoo police. This was in regard to "Fall Out Space," and the total number of square feet of floor space and the number of persons who could be sheltered in case of bombing were established.

Reily Straw represented the Subcommittee at the National Safety Conference's annual convention in Chicago in October 1960.

Sgt. A. L. Canter and Pvt. G. H. Adams attended the General Services Administration "Driver Training School" and are now quali-

fied to test Park employees and other Smithsonian employees for issuance of Government drivers' permits.

Sergeant Canter and Private Adams attended the Federal Safety Council's meeting on the use of safety belts in Government vehicles and gave a report to the subcommittee.

Five fire extinguishers were added to fill the requirements of the District of Columbia Fire Marshall. Directional signs to the extinguishers have been painted and installed. First-aid boxes have been placed in all Park buildings. Exit signs have been installed in all buildings frequented by the public. A shifting conveyor was made in the mechanical shop for use in moving large animals. Red flags and danger signs have been purchased for use on moving vehicles and when work is being done on trees. Public pay telephones have been relocated to aid the public and relieve inside communications, and 14 new telephones and extensions were added to the Park telephone system to improve communications and supply contact in isolated areas.

The police pistol range has been improved, the work being done by the police in their off-duty time with assistance from the grounds and maintenance department.

An oxygen inhalator was added to the police first-aid room for use in case of heart patients, electrical shock, etc. Dr. Wright instructed the police in its use and operation.

BUILDINGS AND GROUNDS

Much of the work accomplished during the past fiscal year was done to insure the safety of visitors, employees, and animals. The District of Columbia Department of Buildings and Grounds, from funds appropriated in FY 60, installed 5,000 feet of standardized visitors' safety fencing in front of many outdoor exhibits. They also repaired the roofs of the small-mammal building, elephant house, and bird house, and the walls and ceiling of the reptile house. The ceiling of the reptile house was sprayed with an accoustical compound, which reduces noise in the building by at least 50 percent. Because of the bad echo, this house had been extremely noisy when filled with people.

The new gorilla cage, which was made by remodeling the former gibbon cage, is now adequate for the apes which came here as babies but are now nearly full-grown animals. This cage has electrically controlled doors for the shifting cage, heavy ¾-inch steel bars, ¼-inch plate glass on the inside quarters, and protective wiring on the outside. The outside enclosure has a roof of corrugated fiberglass panels so that the gorillas can enjoy being outdoors, protected from rain and excessive heat.

Fronts of the other great-ape cages, used by chimpanzees and orangutans, were moved back to allow for more keeper space between the bars and the glass. Formerly there was a possibility that a chimpanzee might reach out through the bars and seize a keeper passing by. While this work was being done, the interior of the cages was brightly painted.

Remodeling of the alligator and crocodile exhibit in the reptile house was done primarily for safety reasons, but resulted in an improvement in the general appearance. The old coping was removed, and ¼-inch glass fronts installed up to a height of 8 feet. A 42-inch guard rail prevents the visitors from tapping on the glass. Inward-curving spikes keep the alligators back from the glass. A child with a 28-inch eye level is able to see all but 10 inches of the water.

In the small-mammal house, the old guard rail was topped with an angled railing that keeps visitors back and makes it impossible for them to reach over and put fingers in the cages.

An attractive new exhibit during the summer of 1961 was the installation of a group of 10 capuchin monkeys on a small island in the waterfowl pond near the crossroads. Trees were cut back so that there is no possibility of the monkeys' jumping from branch to branch to freedom, and the surrounding water is sufficient barrier to keep them from climbing the low fence that surrounds the area. With a small tree-house shelter against inclement weather, the monkeys have done well, and the ducks and geese have accepted the new arrivals with equanimity.

"Beaver Valley," the wooded ravine below the bear dens, which fell into disuse during World War II, was finally restored, and new pools and fencing put in. In addition to the large beaver pond, on which a pair of mute swans raised their young, there are pools for harbor seals, otters, and other aquatic mammals.

Three dens in the main bear line were repaired with reinforced concrete floor slabs, copings, gutters, partition walls, and ironwork. Five cages in the short bear line above the reptile house were also repaired. This meant breaking up old deteriorated concrete walkways, floor slabs, and pools, and replacing them with new concrete.

Major alterations were made to the interior of the old cookhouse, which will now be used as an operating room for animals. An extension to the parking area fronting the pachyderm house was completed, and repairs were made to holes in the main roadways. A new floor was installed in the director's office, as the old one had been badly damaged by termites, and the office was painted.

There was constant repair to old water and sewer systems, to electric lines, heating lines, steam bypasses and return lines, and boilers in the central heating plant. Some new heating lines, conduits, sewer lines,

and storm-water lines were installed. All cleaning of ground areas and burning and hauling of trash to the District dump was done by the mechanical department.

The grounds department found that with new equipment, in particular a Skyworker for trimming high branches, and enlarged personnel, including two dendricians or tree culturists, the 5-year backlog of work was reduced in a satisfactory manner. Two more flower beds were planted and others slightly enlarged. Barberry bushes were planted in strategic spots to deter visitors from walking in unsafe areas. Trees were planted for both shade and forage.

Four more employees in the grounds department attended and completed classes in first aid; instructions were given to some of the keepers and police in the use of the Skyworker in case of emergencies; and all men in the grounds crew were given a one-hour horticultural classroom lesson monthly.

The Washington Star, on June 18, 1961, carried an article in the gravure section entitled "Washington's Toughest Gardening Job," describing the work done by Michael Dubik, supervisory head gardener, and his staff of 10 men.

PLANS FOR THE FUTURE

Owing to the intense interest in plans for the development and growth of the National Zoological Park, the architectural and engineering firm of Daniel, Mann, Mendenhall & Johnson began architectural studies and engineering estimates for a redevelopment of the Zoo. These plans will be completed by September 1961.

Respectfully submitted.

THEODORE H. REED, *Director.*

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, 1961.

SCIENTISTS, STUDENTS, AND OBSERVERS

Following is the list of 43 scientists, students, and observers who visited Barro Colorado Island last year and stayed for several days in order to conduct scientific research or observe the wildlife of the area. Fourteen other scientific visitors each spent a day and a night on the island. In addition, scientists of other research and technical organizations in the Canal Zone and the Republic of Panama made use of station facilities.

Name	*Principal interest*
Barghoorn, Dr. and Mrs. Elso S., Harvard University.	Limnology.
Baskin, Jonathan N., Harvard University.	Study of army ants, dorylines and pomerines.
Bennett, Dr. and Mrs. Charles, Jr., University of California.	Microclimatology.
Blest, Dr. Andrew D., University College, London.	Behavior of Lepidoptera.
Brennan, Dr. and Mrs. James, Middle America Research.	Wildlife observation.
Bumzahem, Mr. and Mrs. Carlos B., University of Illinois.	Herpetology.
Colby, Susan, Smithsonian Institution.	Inspection of facilities.
Craven, Mrs. Harriet P., Fallen Leaf, Calif.	Wildlife observation.
Ebinger, Dr. and Mrs. John, Yale University.	Botany.
Eisenmann, Eugene, New York City.	Ornithology.
Fast, Arthur H., Arlington, Va.	Wildlife observation.
Greenfield, Ray, Honolulu, Hawaii.	Wildlife observation.
Hodgson, Mr. and Mrs. Edward S., Commonwealth Scientific and Industrial Research Organization, Australia.	Ecology.
Klopfer, Dr. Peter H., Duke University.	Tropical ecology.

Name	*Principal interest*
Larsen, Mr. and Mrs. Henry, Geneve, Switzerland.	Wildlife observation.
Lundy, William, Panama Canal Co.	Wildlife observation.
MacArthur, Dr. Robert, Duke University.	Tropical ecology.
Martin, Otis O., Smithsonian Institution.	Fiscal survey.
O'Neill, John P., Norman, Okla.	Ornithology.
Pennoyer, Capt. Ralph G., Virginia Society of Ornithology.	Wildlife observation.
Pohl, Harold, Orange Coast College.	Wildlife observation.
Rubinoff, Mr. and Mrs. Ira, Harvard University.	Ichthyology.
Selsor, C. Jackson, San Diego, Calif.	Wildlife observation.
Smith, Lloyd M., Orange Coast College.	Wildlife observation.
Stirling, Mrs. Matthew W., Washington, D.C.	Wildlife observation.
Stott, Kenhelm, San Diego, Calif.	Wildlife observation.
Straatman, R., CSIRO, Canberra, Australia.	Entomology.
Stuart, Dr. Alastair M., University of Chicago.	Termite behavior.
Sweeney, Mrs. Edward C., Washington, D.C.	Wildlife observation.
Taylor, Mr. and Mrs. R. W., Harvard University.	Ant behavior.
Willis, Edwin, University of California.	Ecology and behavior of birds following army ants.
Williams, Pfc. Carl, Headquarters U.S. Army, Caribbean.	Wildlife observation.
Zimmerman, Mr. and Mrs. John L., University of Illinois.	Physiology of tropical birds.

VISITORS

Approximately 212 visitors were permitted to visit the island for a day.

RAINFALL

During the dry season (January through April) of the calendar year 1960, rains of 0.01 inch or more fell during 52 days (163 hours) and amounted to 26.64 inches, as compared to 1.91 inches during 1959. During the wet season of 1960 (May through December), rains of 0.01 inch or more fell on 172 days (757 hours) and amounted to 113.43 inches, as compared to 92.97 inches during 1959. Total rain for the year was 140.07 inches. During 36 years of record, the wettest year

was 1935 with 143.42 inches, and the driest year was 1930 with only 76.57 inches. February was the driest month of 1960 (0.95 inch) and December the wettest (22.35 inches). The maximum records for short periods were: 5 minutes, 1.30 inches; 10 minutes, 1.65 inches; 1 hour, 4.11 inches; 2 hours, 6.33 inches; 24 hours, 10.87 inches.

TABLE 1.—*Annual rainfall, Barro Colorado Island, Canal Zone*

Year	Total inches	Station average	Year	Total inches	Station average
1925	104.37	----	1943	120.29	109.20
1926	118.22	113.56	1944	111.96	109.30
1927	116.36	114.68	1945	120.42	109.84
1928	101.52	111.35	1946	87.38	108.81
1929	87.84	106.56	1947	77.92	107.49
1930	76.57	101.51	1948	83.16	106.43
1931	123.30	104.69	1949	114.86	106.76
1932	113.52	105.76	1950	114.51	107.07
1933	101.73	105.32	1951	112.72	107.28
1934	122.42	107.04	1952	97.68	106.94
1935	143.42	110.35	1953	104.97	106.87
1936	93.88	108.98	1954	105.68	106.82
1937	124.13	110.12	1955	114.42	107.09
1938	117.09	110.62	1956	114.05	107.30
1939	115.47	110.94	1957	97.97	106.98
1940	86.51	109.43	1958	100.20	106.70
1941	91.82	108.41	1959	94.88	106.48
1942	111.10	108.55	1960	140.07	107.41

TABLE 2.—*Comparison of 1959 and 1960 rainfall, Barro Colorado Island (inches)*

Month	Total		Station average	Years of record	1960 excess or deficiency	Accumulated excess or deficiency
	1959	1960				
January	0.32	2.96	2.17	35	+.79	----
February	0.15	.95	1.36	35	−.41	+.38
March	0.11	4.47	1.27	35	+3.20	+3.58
April	1.33	18.26	3.39	36	+14.87	+18.45
May	8.89	15.55	10.98	36	+4.57	+23.02
June	8.29	11.53	10.84	36	+.69	+23.71
July	8.86	11.46	11.63	36	−.17	+23.54
August	8.62	7.02	12.21	36	−5.19	+18.35
September	14.69	9.49	10.18	36	−.69	+17.66
October	9.03	19.50	14.06	36	+5.44	+23.10
November	10.18	16.53	18.16	36	−1.63	+21.47
December	24.41	22.35	11.16	36	+11.19	+32.66
Year	94.88	140.07	107.41	----	----	+32.66
Dry season	1.91	26.64	8.19	----	----	+18.45
Wet season	92.97	113.43	99.22	----	----	+14.21

BUILDINGS, EQUIPMENT, AND IMPROVEMENTS

The existing facilities on Barro Colorado Island were improved in a number of ways during the last year. The top floor of the Old Laboratory was renovated to provide additional living accommodations for visiting scientists. The reconstruction of Barbour House at its new site, necessitated by the 1959 landslide, was completed. Extensive repairs were made to the dock, and a new landing stage, to facilitate loading and unloading of gas and diesel oil drums, was constructed. Routine maintenance activities included painting some buildings, and minor repairs to several houses and aviaries. One generator was overhauled, and a new electric ⅓-hp. water pump was installed. New rain-recording equipment is in process of being installed by the Hydrographic Office of the Panama Canal Company. Expansion of the library continued.

OTHER ACTIVITIES

Scientific research conducted on Barro Colorado Island during the past year encompassed every field of tropical natural history except anthropology.

The Resident Naturalist continued his research on the behavior of several groups of tropical birds and monkeys. Field observations of the behavior of tropical American carnivores were completed.

Dr. John Ebinger, of Yale University, conducted botanical studies in addition to adding considerably to the collection of botanical specimens and reorganizing the station herbarium.

John Zimmerman continued the research on the physiology of tropical birds begun in 1959 by Dr. Charles Kendeigh of the University of Illinois. Other research projects continued dealt with temperature and humidity gradients conducted by Dr. Charles F. Bennett, Jr., and the analysis of the behavior of Lepidoptera by Dr. Andrew Blest. A summary of Dr. Blest's earlier work on Barro Colorado Island appeared in the Annual Report of the Smithsonian Institution for 1959.

Termites and ants, both of which have been favored subjects for study from the inception of the station, continued to provide material for several scientists. Those birds that follow army ants were the subject of a year-long investigation by Edwin Willis of the University of California.

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 to the laboratory through the payment of table subscriptions: Eastman Kodak Co.,

New York Zoological Society, and Smithsonian Institution. Donations are also gratefully acknowledged from Eugene Eisenmann and C. M. Goethe.

PLANS AND REQUIREMENTS

The only major building project in view is the reconstruction of the boathouse for which work plans have been made. Plans have also been made to overhaul the *Snook*, the large motor launch.

The improvement of the library will continue.

Within the next few years several major items of equipment will need to be replaced.

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 Lt. Gov. John D. McElheny, and the Executive Secretary Paul 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, Chief of the Dredging Division, and members of his staff; and C. C. Soper of the Eastman Kodak Co.

Respectfully submitted.

MARTIN H. MOYNIHAN,
Resident Naturalist.

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the International Exchange Service

SIR: I have the honor to submit the following report of the activities of the International Exchange Service for the fiscal year ended June 30, 1961:

The International Exchange Service was initiated by the Smithsonian Institution in the early years of its existence for the interchange of scientific publications between learned societies and individuals in the United States and those of foreign countries. It serves as a means of developing and executing, in part, the broad and comprehensive objective of the Institution, "the diffusion of knowledge."

The Smithsonian Institution is the official United States agency for the exchange with other nations of governmental, scientific, and literary publications. The International Exchange Service is the bureau designated to carry out the functions assigned to the Smithsonian Institution in various conventions, treaties, and international agreements relating to the international exchange of publications.

Publications were received from approximately 250 domestic sources including United States Government bureaus and departments, congressional committees and members of Congress, universities, agricultural experiment stations, learned societies, organizations, and individuals for transmission to foreign addressees in more than 100 foreign countries. Among the publications received for transmission abroad are the following: Language, Journal of the Linguistic Society of America; Journal of the National Education Association; Journal of the American Dental Society; Journal of Science, Iowa State College; Virginia Journal of Science, University of Virginia; Novitates, American Museum of Natural History; Expedition, University Museum, University of Pennsylvania; Brevoria, Museum of Comparative Zoology, Harvard College; Anthropological Record, University of California; Yale University Bulletin; Yearbook of the Carnegie Institution of Washington; Zoologica, New York Zoological Society; Transactions of the American Geophysical Union; Transactions of the American Association of Physicians; Transactions of the American Society of Mechanical Engineers; American Midland Naturalist; Museum of Art Register, University of Kansas; Paleontological Contributions, University of Kansas; Oregon Law Review, University of

609118—61——14

Oregon; Studies in English, University of Texas; Proceedings of the American Philosophical Society; Contributions, Scripps Institution of Oceanography; and Annals of the Missouri Botanical Garden.

The number of packages of publications received for transmission during the year was 1,272,604, an increase of 130,606 over the previous fiscal year. The weight of the packages received was 923,179 pounds, an increase of 45,543 over the previous fiscal year.

The packages of publications are forwarded by ocean freight to the port of entry selected by the foreign exchange bureau to whom the shipment is consigned. They are then distributed by the foreign exchange bureau to the intended addressees.

In the countries where there is no exchange bureau, the publications are mailed directly to the addressees. However, if the weight of the packages (intended for one addressee) would make it more economical to forward by ocean freight, the packages are so transmitted to the port selected by the addressee, who must make all arrangements for accepting the shipment at that port of entry.

The total weight of the packages forwarded during the year amounted to 895,010 pounds, of which 571,181 pounds were forwarded by ocean and domestic freight, and 323,829 pounds were forwarded by mail or other means. This was 24,226 pounds more than was forwarded during the previous fiscal year. The number of cases shipped to the foreign exchange bureaus was 3,375, or 74 less than during the previous fiscal year. Of these cases 1,028 were for the full depository recipients of official United States publications which were compiled and forwarded in accordance with bilateral treaties made between the United States and other countries for the exchange of official publications.

Shipments are made to Formosa. No shipments are being made to the mainland of China, North Korea, and Communist-controlled area of Viet-Nam.

FOREIGN DEPOSITORIES OF GOVERNMENTAL DOCUMENTS

The recipients of the official United States publications are determined as a result of bilateral treaties entered into between the United States and the various foreign countries for the mutual exchange of their official publications. The treaty stipulates whether the recipient will receive all the official publications of the United States Government or only a selected list. The recipient receiving all the official publications is classified as a full depository. The recipient receiving a selected list is classified as a partial depository. The International Exchange Service receives copies of all the official United States publications. These are sorted and transmitted to the depositories designated by the Library of Congress. During the past fiscal year there were 598,238 pieces weighing 184,264 pounds assembled for transmis-

sion to the full depository recipients, and 71,940 pieces weighing 31,108 pounds assembled and transmitted to the partial depository recipients. The names and addresses of the full and partial depositories are given in the following list:

DEPOSITORIES OF 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: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: State Library, Perth.
AUSTRIA: Administrative Library, Federal Chancellery, Vienna.
BRAZIL: Biblioteca Nacional, Rio de Janeiro.
BULGARIA: Bulgarian Bibliographical Institute, Sofia.[1]
BURMA: Government Book Depot, Rangoon.
CANADA: Library of Parliament, Ottawa.
MANITOBA: Provincial Library, Winnipeg.
ONTARIO: Legislative Library, Toronto.
QUEBEC: Library of the Legislature of the Province of Quebec.
CEYLON: Department of Information, Government of Ceylon, Colombo.
CHILE: Biblioteca Nacional, Santiago.
CHINA: National Central Library, Taipei, Taiwan.
National Chengchi University, Taipei, Taiwan.
COLOMBIA: Biblioteca Nacional, Bogotá.
COSTA RICA: Biblioteca Nacional, San José.
CUBA: Dirección de Asuntos Culturales, Ministerio de Relaciones Exteriores, Habana.[2]
CZECHOSLOVAKIA: University Library, Prague.
DENMARK: Institut Danois des Échanges Internationaux, Copenhagen.
EGYPT: Bureau des Publications, Ministère des Finances, Cairo.
FINLAND: Parliamentary Library, Helsinki.
FRANCE: Bibliothèque Nationale, Paris.
GERMANY: Deutsche Staatsbibliothek, Berlin.
Free University of Berlin, Berlin-Dahlem.
Parliamentary Library, Bonn.
GREAT BRITAIN:
ENGLAND: British Museum, London.
LONDON: London School of Economics and Political Science. (Depository of the London County Council.)
HUNGARY: Library of Parliament, Budapest.[1]
INDIA: National Library, Calcutta.
Central Secretariat Library, New Delhi.
Parliament Library, New Delhi.
INDONESIA: Ministry for Foreign Affairs, Djakarta.
IRELAND: National Library of Ireland, Dublin.
ISRAEL: State Archives and Library, Hakirya, Jerusalem.

[1] Shipment suspended.
[2] Change in address.

ITALY: Ministero della Pubblica Istruzione, Rome.
JAPAN: National Diet Library, Tokyo.[3]
MEXICO: Secretaría de Relaciones Exteriores, Departamento de Información para el Extranjero México, D.F.
NETHERLANDS: Royal Library, The Hague.
NEW ZEALAND: General Assembly Library, Wellington.
NORWAY: Utenriksdepartmentets Bibliothek, Oslo.
PERU: Sección de Propaganda y Publicaciones, Ministerio de Relaciones Exteriores, Lima.
PHILIPPINES: Bureau of Public Libraries, Department of Education, Manila.
POLAND: Bibliothèque Nationale, Warsaw.[1]
PORTUGAL: Biblioteca Nacional, Lisbon.
SPAIN: Biblioteca Nacional, Madrid.
SWEDEN: Kungliga Biblioteket, Stockholm.
SWITZERLAND: Bibliothèque Centrale Fédérale, Berne.
TURKEY: National Library, Ankara.
UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.
UNION OF SOVIET SOCIALIST REPUBLICS: All-Union Lenin Library, Moscow.
UNITED NATIONS: Library of the United Nations, Geneva, Switzerland.
URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
VENEZUELA: Biblioteca Nacional, Caracas.
YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.[3]

DEPOSITORIES OF PARTIAL SETS

AFGHANISTAN: Library of the Afghan Academy, Kabul.
BELGIUM: Bibliothèque Royale, Bruxelles.
BOLIVIA: Biblioteca del Ministerio de Relaciones Exteriores y Culto, La Paz.
BRAZIL: MINAS GERAIS: Departmento Estadul de Estatistica, Belo Horizonte.
BRITISH GUIANA: Government Secretary's Office, Georgetown, Demerara.
CANADA:
ALBERTA: Provincial Library, Edmonton.
BRITISH COLUMBIA: Provincial Library, Victoria.
NEW BRUNSWICK: Legislative Library, Fredericton.
NEWFOUNDLAND: Department of Provincial Affairs, St. John's.
NOVA SCOTIA: Provincial Secretary of Nova Scotia, Halifax.
SASKATCHEWAN: Legislative Library, Regina.
DOMINICAN REPUBLIC: Biblioteca de la Universidad de Santo Domingo, Ciudad Trujillo.
ECUADOR: Biblioteca Nacional, Quito.
EL SALVADOR:
Biblioteca Nacional, San Salvador.
Ministerio de Relaciones Exteriores, San Salvador.
GREECE: National Library, Athens.
GUATEMALA: Biblioteca Nacional, Guatemala.
HAITI: Bibliothèque Nationale, Port-au-Prince.
HONDURAS:
Biblioteca Nacional, Tegucigalpa.
Ministerio de Relaciones Exteriores, Tegucigalpa.
ICELAND: National Library, Reykjavik.
INDIA:
BOMBAY: Secretary to the Government, Bombay.
BIHAR: Revenue Department, Patna.

[3] Receives two sets.

KERALA: Kerala Legislature Secretariat, Trivandrum.
UTTAR PRADESH:
University of Allahabad, Allahabad.
Secretariat Library, Lucknow.
WEST BENGAL: Library, West Bengal Legislative Secretariat, Assembly House, Calcutta.
IRAN: Imperial Ministry of Education, Tehran.
IRAQ: Public Library, Baghdad.
JAMAICA:
Colonial Secretary, Kingston.
University College of the West Indies, St. Andrew.
LEBANON: American University of Beirut, Beirut.
LIBERIA: Department of State, Monrovia.
MALAYA: Federal Secretariat, Federation of Malaya, Kuala Lumpur.
MALTA: Minister for the Treasury, Valletta.
NICARAGUA: Ministerio de Relaciones Exteriores, Managua.
PAKISTAN: Central Secretariat Library, Karachi.
PANAMA: Ministerio de Relaciones Exteriores, Panamá.
PARAGUAY: Ministerio de Relaciones Exteriores, Sección Biblioteca, Asunción.
PHILIPPINES: House of Representatives, Manila.
SCOTLAND: National Library of Scotland, Edinburgh.
SIAM: National Library, Bangkok.
SINGAPORE: Chief Secretary, Government Offices, Singapore.
SUDAN: Gordon Memorial College, Khartoum.

INTERPARLIAMENTARY EXCHANGE OF THE OFFICIAL JOURNAL

There are now being sent abroad 87 copies of the Federal Register and 100 copies of the Congressional Record. This is an increase over the preceding year of three copies of the Congressional Record with no change in the recipients of the Federal Register. The countries to which these journals are being forwarded are given in the following list.

DEPOSITORIES OF CONGRESSIONAL RECORD AND FEDERAL REGISTER

ARGENTINA:
Biblioteca de la H. Legislatura de Mendoza, Mendoza.[4]
Biblioteca del Poder Judicial, Mendoza.[5]
Boletin Oficial de la República Argentina, Buenos Aires.
Cámara de Diputados Oficina de Información Parliamentaria, 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: Public Library of Victoria, Melbourne.[5]
WESTERN AUSTRALIA: Library of Parliament of Western Australia, Perth.
BELGIUM: Bibliothèque du Parlement, Palais de la Nation, Brussels.[4 6]
BRAZIL: Biblioteca da Câmara dos Deputados, Brasilia, D.F.[4 6]
BRAZIL: Secretaria da Presidencia, Rio de Janeiro.[4]
BRITISH HONDURAS: Colonial Secretary, Belize.
CAMBODIA: Ministry of Information, Phnom Penh.

[4] Congressional Record only.
[5] Federal Register only.
[6] Added during the year.

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: Ceskoslovenska Akademie Ved. Prague.[4]
EGYPT: Ministry of Foreign Affairs, Egyptian Government, Cairo.[4]
FINLAND: Library of the Parliament, Helsinki.[4 6]
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]
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.[5]
Deutscher Bundesrat, Bonn.[4]
Deutscher Bundestag, Bonn.[4]
Hamburgisches Welt-Wirtschafts-Archiv, Hamburg.
Westdeutsche Bibliothek, Marburg, Hessen.[4 6 7]
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 8]
Printed Library of the Foreign Office, London.
Royal Institute of International Affairs, London.[4]
GREECE: Bibliothèque, Chambre des Députés Hellênique, Athens.
GUATEMALA: Biblioteca de la Asamblea Legislativa, Guatemala.
HAITI: Bibliothèque Nationale, Port-au-Prince.
HONDURAS: Biblioteca del Congreso Nacional, Tegucigalpa.
HUNGARY: Országos Széchenyi Konyvtár, 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.

---

[7] Three copies.
[8] Two copies.

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 Republica, 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 Informacion, Secretaría de Governación, 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.

CHIAPAS: Gobernador del Estado de Chiapas, Tuxtla Guitiérrez.

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.

MÈXICO: 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 LÈON: 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.

NORWAY: Library of the Norwegian Parliament, Oslo.

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: Boletin Oficial del Estado, Presidencia del Gobierno, Madrid.[5]

SWITZERLAND: Bibliothèque, Bureau International du Travail, Geneva.[5]
International Labor Office, Geneva.[5,8]
Library, United Nations, Geneva.
TOGO: Ministere d' Etat, 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'niia Biblioteka Obshchestvennykh Nauk, Moscow.
URUGUAY: Diario Oficial, Calle Florida 1178, Montevideo.
YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.[8]

FOREIGN EXCHANGE SERVICES

Exchange publications for addressees in the countries listed below are forwarded by freight to the exchange services of those countries. Exchange publications for addressees in other countries are forwarded directly by mail.

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: Delegation 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 Echanges Internationaux, Országos Széchenyi Konyvtár, Budapest.
INDIA: Government Printing and Stationery, 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, Bibilothèque de l'Université Royale, Oslo.
PHILIPPINES: Bureau of Public Libraries, Department of Education, Manila.
POLAND: Service Polonais des Échanges Internationaux, Bibliothèque Nationale, Warsaw.
PORTUGAL: Seccão 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 SOCIALISTS REPUBLICS: Bureau of Book Exchange, State Lenin Library, Moscow.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: State Library, Perth.
YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.

The number of packages and the weight of the packages received from sources in the United States for transmission abroad, and the packages received from foreign sources intended for domestic addressees are classified in the following 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
United States parliamentary documents received for transmission abroad	746, 298	354, 886	----------	----------
Publications received from foreign sources for United States parliamentary addressees	----------	----------	10, 819	14, 613
United States departmental documents received for transmission abroad	249, 019	235, 823	----------	----------
Publications received from foreign sources for United States departmental addressees	----------	----------	4, 721	11, 651
Miscellaneous scientific and literary publications received for transmission abroad	205, 972	220, 240	----------	----------
Miscellaneous scientific and literary publications received from abroad for distribution in the United States	----------	----------	55, 775	85, 966
Totals	1, 201, 289	810, 949	71, 315	112, 230
Grand total	1,272,604 packages		923,179 pounds	

Respectfully submitted.

J. A. COLLINS, *Chief.*

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 twenty-fourth annual report of the National Gallery of Art, for the fiscal year ended June 30, 1961. This report is made pursuant to the provisions of section 5(d) of Public Resolution No. 14, Seventy-fifth Congress, first 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 four general trustees continuing in office during the fiscal year ended June 30, 1961, were Ferdinand Lammot Belin, Chester Dale, Paul Mellon, and Rush H. Kress. Duncan Phillips, a general trustee, resigned from the Board of Trustees on December 1, 1960, and on May 3, 1961, John Hay Whitney was elected a general trustee of the National Gallery of Art to serve in that capacity for the remainder of the term expiring July 1, 1963. On May 4, 1961, Chester Dale was reelected by the Board of Trustees to serve as President of the Gallery and Paul Mellon was elected Vice President.

The executive officers of the Gallery as of June 30, 1961, are as follows:

Huntington Cairns, Secretary-Treasurer.
John Walker, Director.
Ernest R. Feidler, Administrator.
Huntington Cairns, General Counsel.
Perry B. Cott, Chief Curator.

The three standing committees of the Board, as constituted at the annual meeting on May 4, 1961, were as follows:

EXECUTIVE COMMITTEE

Chief Justice of the United States, Earl Warren, Chairman.
Chester Dale, Vice Chairman.
Secretary of the Smithsonian Institution, Leonard Carmichael.
Paul Mellon.
John Hay Whitney.

FINANCE COMMITTEE

Secretary of the Treasury, C. Douglas Dillon, Chairman.
Chester Dale, Vice Chairman.
Paul Mellon.
Secretary of the Smithsonian Institution, Leonard Carmichael.
John Hay Whitney.

ACQUISITIONS COMMITTEE

Paul Mellon, Chairman.
Chester Dale.
John Hay Whitney.
John Walker.

PERSONNEL

At the close of the year full-time Government employees on the staff of the National Gallery numbered 312, as compared with 314 employees at the close of the previous fiscal year. The United States 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. Under the provisions of this act, the Gallery secured training and development of several of its employees in their profession to help maintain the standing and prestige of the Gallery. Among those for whom training was provided during the year were the assistant chief curator, the curator of painting, the curator of education, and the associate curator of education.

APPROPRIATIONS

For the fiscal year ended June 30, 1961, the Congress of the United States in the regular annual appropriation for the National Gallery of Art provided $1,848,000 to be used for salaries and expenses in the operation and unkeep of the Gallery, 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). Congress also included in a supplemental appropriation act $72,000 to cover pay increases not provided for in the regular appropriation. The total appropriation for the fiscal year was $1,920,000.

The following expenditures and encumbrances were incurred:

Personal services	$1, 569, 500. 00
Other than personal services	350, 395. 29
Unobligated balance	104. 71
Total	1, 920, 000. 00

ATTENDANCE

There were 1,032,340 visitors to the Gallery during the fiscal year 1961, an increase of 67,150 over the total attendance of 965,190 visitors during the fiscal year 1960. The average number of visitors daily was 2,843.

ACCESSIONS

There were 1,387 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

Donor	*Artist*	*Title*
Coe Foundation, New York, N.Y.	Beechey	General Sir Thomas Picton.
Do	Cotes	Miss Elizabeth Crewe.
Do	Gainsborough	William Yelverton Davenport.
Do	Miereveld	Portrait of a Lady with a Ruff.
Chester Dale, New York, N.Y.	Stuart	Lady Liston.
The Fuller Foundation, Inc., Boston, Mass.	Reynolds	Squire Musters.
Do	Gainsborough	Master John Heathcote.
Do	Turner	The Dogana and Santa Maria della Salute, Venice.
Colonel and Mrs. Edgar W. Garbisch, New York, N.Y.	Greenwood	Mrs. Welshman.
The Adele R. Levy Fund, Inc., New York, N.Y.	Renoir	Madame Henriot.
National Gallery of Art Purchase Fund—	Copley	The Copley Family.
Andrew W. Mellon Gift.	de Heem	Vase of Flowers.
Mrs. Lillian S. Timken, New York, N.Y.	Fry	Landscape.
Do	----do	Potters in Landscape.
Do	----do	Obv.: Seascape. Rev.: Landscape with Palm Tree.
Do	----do	Sheep by Stream and Field.

SCULPTURE

Stanley Mortimer, Litchfield, Conn.	Italian School, XVI Century.	Farnese Hercules.

DECORATIVE ARTS

Coe Foundation, New York, N.Y.	Flemish Gothic Tapestry.	The Return from the Hunt.

GRAPHIC ARTS

During the year Mrs. E. C. Chadbourne gave a colored mezzotint portrait of George III with autograph of George I. An etching entitled "Pastorale" by Hans Thoma was given by Rabbi Hugo B. Schiff, and a water color entitled "The Clipper Ship *Minnie G. Loud*" by Roux was given by Robert Peet Skinner.

OTHER GIFTS

During the fiscal year 1961 gifts of money were made by The A. W. Mellon Educational and Charitable Trust, Old Dominion Foundation,

Avalon Foundation, Calouste Gulbenkian Foundation, The Fein Foundation, James N. Rosenberg, Irving R. Saal, Mrs. John T. Terry, and various donors in memory of Mrs. Dorothy V. Keppel. An additional cash bequest was received from the estate of William Nelson Cromwell.

EXCHANGE OF WORKS OF ART

In exchange for nine works of art in the Samuel H. Kress Collection, the Kress Foundation gave the National Gallery of Art the following pieces of sculpture:

Artist	*Title*
Tino di Camaino	Madonna and Child with Queen Sancia, Saints and Angels.
Giovanni di Balduccio	Charity.
Bonino da Campione	Justice.
Do	Prudence.
Orcagna	Angel with Tambourine.
Do	Angel with Hurdy-Gurdy.
Quercia, Jacopo della	Madonna of Humility.
Master of the Mascoli Altar	Angel of the Annunciation.
Do	Virgin of the Annunciation.
Do	St. Peter.
Do	St. Paul.
Benedetto da Maiano	Madonna and Child.
Fiamberti	Madonna and Child.
Robbia, Andrea della	The Adoration of the Child.
Robbia, Luca della	Nativity.
Solari, Cristoforo	Madonna and Child.
Michelangelo (attr. to)	Apollo and Marsyas.
Sansovino	Madonna and Child.
Coysevox	Louis of France, The Grand Dauphin.
French School, Early 18th Century	Louis, Duc de Bourgogne.
Desjardins	Louis XIV.
Riemenschneider	St. Burchard of Würzburg.

In exchange for a print by Odilon Redon entitled "Profile de Lumière" in the Lessing J. Rosenwald Collection, Mr. Rosenwald gave the National Gallery of Art a superior impression of the same print.

WORKS OF ART ON LOAN

The following works of art were received on loan by the Gallery:

From	*Artist*	*Title*
Robert Woods Bliss, Washington, D.C.		28 objects of Pre-Columbian Art.
Mrs. Mellon Bruce, New York, N.Y.	Goya	Condesa de Chinchón.
Chester Dale, New York, N.Y.	Bellows	Blue Morning.
Do	Monet	The Seine at Giverny.
Jerome Hill, New York, N.Y.	Delacroix	The Arab Tax.
Do	----do	Fanatics of Tangiers.

To	*Artist*	*Title*
Samuel H. Kress Foundation, New York, N.Y.	Master of Badia a Isola.	Madonna Enthroned with Angels.
Do	Signorelli	Madonna and Child with Saints.
Do	Tintoretto	Summer.
Mrs. Eugene 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:

To	*Artist*	*Title*
Robert Woods Bliss, Washington, D.C.		6 objects of Pre-Columbian Art.
Mrs. Mellon Bruce, New York, N.Y.	Pissarro	Spring at Louveciennes.
Stephan Walter Cassirer, Copenhagen, Denmark.	Cézanne	Pears.
The Calouste Gulbenkian Foundation, Lisbon, Portugal.	Egyptian, Saite Period.	Statuette of the Courtier Bes.
Do	Egyptian, Saite Period.	Head of a Priest.
Samuel H. Kress Foundation, New York, N.Y.		30 paintings and 8 sculptures.
Mrs. Eugene Meyer, Washington, D.C.	Dufresne	Still Life.
Do	Renoir	Nude.
Do	Renoir	Man Lying on a Sofa.
Richard W. Norton, Shreveport, La.	Bingham	The Result of the Election.

WORKS OF ART LENT

During the fiscal year the Gallery lent the following works of art for exhibition purposes:

To	*Artist*	*Title*
American Federation of Arts, New York, N.Y.	Daumier (bronze)	Le Dédaigneux (Prunelle).
Do	Daumier (bronze)	Le Rieur Edente.
Do	Daumier (bronze)	Le Stupide (Chevandier de Valdrome).
Birmingham Museum of Art, Birmingham, Ala.	Sully	Andrew Jackson.
University of California, UCLA Art Galleries, Los Angeles, Calif.	Boucher	Tête-à-Tête (drawing).
Do	Moreau le Jeune	La Petite Loge (drawing).
Corcoran Gallery of Art, Washington, D.C.	Ryder	Mending the Harness.
Do	Ryder	Siegfried and the Rhine Maidens.

To	*Artist*	*Title*
El Paso Museum of Art, El Paso, Tex.	Stuart	Betsey Hartigan.
Do	West	Self-Portrait.
Do	Trumbull	William Rogers.
Do	Eichholtz	The Ragan Sisters.
Do	Copley	Henry Laurens.
Do	Peale	Benjamin Harrison.
Department of Justice, Washington, D.C.	Dupré	The Old Oak.
Do	Diaz de la Peña	Forest Scene.
Do	Tanner	Engagement between the Monitor and Merrimac, Hampton Roads.
Do	Unknown	Lexington Battle Monument.
Do	do	Leaving the Manor House.
Do	do	Village by the River.
Do	do	Regatta Near Sandy Hook.
Smithsonian Institution, Washington, D.C.	Roux	The Clipper Ship "Minnie G. Loud."
Department of State, American Embassy, London.	Beechey	General Sir Thomas Picton.
Do	Cotes	Miss Elizabeth Crewe.
Do	Gainsborough	William Yelverton Davenport.
Do	Miereveld	Portrait of a Lady with a Ruff.
Do	Flemish Gothic Tapestry.	The Return from the Hunt.
Department of State, Washington, D.C.	Brussels, 17th-Century Tapestry.	America.
Do	Harpignies	Landscape.
Do	Feke	Portrait of a Lady.
Do	Benbridge	Portrait of a Man.
Do	Peale	George Washington.
Do	Lambdin	Abraham Lincoln.
Do	Romney	Sir Archibald Campbell.
Virginia Museum of Art, Richmond, Va.	Stuart	Mrs. Richard Yates.
The White House, Washington, D.C.	Hassam	Allies Day, May 1917.
Do	Audubon	Farmyard Fowls.
Do	Bard	Steamer St. Lawrence.
Do	Unknown	Flowers and Fruit.
Do	Winterhalter	Queen Victoria.
Do	MacKay	Catherine Brower.
Do	Volk	Abraham Lincoln.
Do	Schrag	Solitude (engraving).
Do	Marini	Cavalier Rouge (colored lithograph).
Woodlawn Plantation, Mt. Vernon, Va.	Polk	General Washington at Princeton.

EXHIBITIONS

The following exhibitions were held at the National Gallery of Art during the fiscal year 1961:

Prints by Toulouse-Lautrec. From the Rosenwald Collection. Continued from previous fiscal year through August 15, 1960.

French 18th-Century Prints and Drawings. From the Widener Collection. Continued from previous fiscal year through September 14, 1960.

Prints by Hogarth. From the Rosenwald Collection. August 16, 1960, through December 1, 1960.

Exhibitions of recent accessions. Paintings from the Timken Collection, August 30, 1960, through September 30, 1960; "Madame Henriot" by Renoir, February 26, 1961, through March 15, 1961; "Squire Musters" by Reynolds, "Master John Heathcote" by Gainsborough, and "The Dogana and Santa Maria della Salute, Venice" by Turner, May 6, 1961, through June 4, 1961.

Italian Drawings from Five Centuries. Lent by Italian Museums. October 9, 1960, through November 6, 1960.

Italian Prints. From the Rosenwald Collection. October 9, 1960, through November 6. 1960.

Manuscript Illuminations, XIth–XVth Century. From the Rosenwald Collection. October 9, 1960, through February 2, 1961.

The Splendid Century: French Art of the Seventeenth Century. Sponsored by the Government of France and arranged by the Direction Générale des Affaires Culturelles and the Association Française d'Action Artistique. November 10, 1960, through December 15, 1960.

Christmas Prints. From various donors. December 2, 1960, through March 5, 1961.

The Civil War, A Centennial Exhibition of Eyewitness Drawings. From 18 collections and private lenders. January 8 through February 12, 1961.

Rembrandt Etchings. From various donors. February 3 through March 21, 1961.

The Marie and Averell Harriman Collection. From the collection of the Honorable and Mrs. W. Averell Harriman. April 16 through May 14, 1961.

Chinese Art Treasures. Sponsored by the Government of the Republic of China. May 28, 1961, to continue into the next fiscal year.

Early American Lighting Devices. From the Index of American Design. March 5, 1961, to continue into the next fiscal year.

TRAVELING EXHIBITIONS

Rosenwald Collection.—Special exhibitions of prints, drawings, and sculpture from the Rosenwald Collection were circulated during the fiscal year to 30 museums, universities, schools, and art centers in the United States.

Index of American Design.—During the fiscal year 1961, 22 traveling exhibitions (753 plates and 60 lithographs) were circulated in this country to 15 States and the District of Columbia.

CURATORIAL ACTIVITIES

Under the direction of Dr. Perry B. Cott, chief curator, the curatorial department accessioned 43 gifts to the Gallery during the fiscal year 1961. Advice was given regarding 670 works of art brought

1. Reynolds: Squire Musters. National Gallery of Art. Given in Memory of Governor Alvan T. Fuller by the Fuller Foundation.

2. Gainsborough: Master John Heathcote. National Gallery of Art. Given in memory of Governor Alvan T. Fuller by the Fuller Foundation.

Turner: The Dogana and Santa Maria della Salute, Venice. National Gallery of Art. Given in memory of Governor Alvan T. Fuller by the Fuller Foundation.

Copley: The Copley Family. National Gallery of Art Purchase Fund, Andrew W. Mellon Gift.

Renoir: Madame Henriot. National Gallery of Art. Gift of the Adele R. Levy Fund, Inc.

1. Renoir: Girl with a Basket of Fish. National Gallery of Art. Gift of William Robertson Coe.

2. Renoir: Girl with a Basket of Oranges. National Gallery of Art. Gift of William Robertson Coe.

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 3,700 inquiries, many of them requiring research, were answered verbally and by letter.

Dr. Cott addressed the North Carolina State Art Society on the occasion of the opening of the Samuel H. Kress Collection in the North Carolina Museum of Art at Raleigh.

Miss Elizabeth Mongan, curator of graphic arts, lectured on Graphic Arts at Notre Dame University; the Renaissance Society, Cambridge, Mass.; and the Art Institute of Chicago.

Dr. H. Lester Cooke, curator of painting, lectured at the Smithsonian Institution and at Georgetown University.

Dr. Katherine Shepard, assistant curator of graphic arts, served again as secretary of the Washington Society of the Archaeological Institute of America. She gave a graduate course in Ancient Sculpture the first semester and a graduate course in Ancient Painting the second semester, at Catholic University.

John Pancoast, registrar, gave a graduate seminar in Italian Renaissance Sculpture at Catholic University.

The Richter Archives received and cataloged over 180 photographs on exchange from museums here and abroad, 2,178 photographs were purchased, and about 5,000 reproductions have been added to the Richter Archives.

RESTORATION

Francis Sullivan, resident restorer of the Gallery, made regular and systematic inspection of all works of art in the Gallery and periodically removed dust and bloom as required. He relined 12 paintings and gave special treatment to 36. Sixteen paintings were X-rayed as an aid in research. Mr. Sullivan supervised the construction of a vacuum hot-table and used it as an adjunct in the relining of paintings. Experiments were continued with the application of 27H and other synthetic varnishes developed by the National Gallery of Art Fellowship at the Mellon Institute of Industrial Research, Pittsburgh, Pa. Proofs of all color reproductions of Gallery paintings were checked and approved, and technical advice on the conservation of paintings was furnished to the public upon request.

PUBLICATIONS

William P. Campbell, assistant chief curator, wrote the introduction and catalog notes for the catalog of the exhibition *The Civil War, A Centennial Exhibition of Eyewitness Drawings.*

Miss Elizabeth Mongan, curator of graphic arts, wrote introductions for two exhibition catalogs.

609118—61——15

Dr. H. Lester Cooke, curator of painting, wrote an article entitled "Great Masters of Impressionist Art: the Dale Collection," *National Geographic Magazine*, May 1961. He was also coauthor of "Roman Drawings at Windsor Castle," Phaidon Press, 1960, and wrote articles for *America Illustrated.*

Dr. Katharine Shepard, assistant curator of graphic arts, reviewed a book for the *American Journal of Archaeology*, April 1961.

Miss Anna M. Voris, museum curator, wrote an article on "Art Galleries" for the *American Oxford Encyclopedia.*

During the fiscal year 1961 the Publications Fund published the remaining two in a series of ten booklets, *Schools of Painting in the National Gallery of Art*, and began the sale of boxed sets in slipcases. Two new catalogs were published, *The Civil War* and *Exhibition of the Marie and Averell Harriman Collection*, as well as a new edition of *Twentieth Century Painting from the Chester Dale Collection.* New material placed on sale by the Publications Fund included "Horace Walpole" by Wilmarth Sheldon Lewis, the 1960 A. W. Mellon Lecturer in the Fine Arts; "The Revolution," a recording by Richard Bales of the Gallery staff; "Ratapoil," a sculpture reproduction of a work by Daumier in the Rosenwald Collection; "Roman Drawings at Windsor Castle" by Hereward Lester Cooke of the Gallery staff and Sir Anthony Blunt; and two new collotype reproductions of portraits by Roberti in the Kress Collection.

Five new color and eight new monotone postcards and an 11 x 14″ reproduction of the Chalice of the Abbot Suger of Saint-Denis were published. The Christmas card selection included seven new color and four new black-and-white subjects.

In connection with the exhibition of Chinese Art Treasures, a special sales area was set up in the central lobby at which fifty 2 x 2″ slides published by the Fund were sold, as well as postcards, small and large prints, scrolls, books, and the exhibition catalog.

EDUCATIONAL PROGRAM

The program of the Educational Office was carried out under the direction of Dr. Raymond S. Stites, curator in charge of educational work, and his staff. The staff lectured and conducted tours on the works of art in the Gallery's collection.

Attendance for the General Tours, Tours of the Week, and Picture of the Week talks, totaled 38,839, and that of the auditorium lectures on Sunday afternoons totaled 12,433 persons.

Special lectures, tours, and conferences were arranged for 376 groups and individuals, and the total number of persons served in this manner was 14,088. These included groups of visitors from Government agencies, club and study groups, foreign students, religious organiza-

tions, convention groups, and women's organizations. These special services were also given to school groups from all over the country.

The program of training volunteer docents continued and instruction was given to approximately 100 volunteers. By special arrangement with the school systems of the District of Columbia and the surrounding counties of Maryland and Virginia these volunteers conducted tours for 1,724 classes with a total of 51,920 children, an increase of 5,336 children over last year's total.

The staff of the Educational Office delivered 10 lectures in the auditorium on Sunday afternoons, and 30 lectures were given by guest lecturers. André Grabar delivered the Tenth Annual Series of the A. W. Mellon Lectures in the Fine Arts, beginning April 16, 1961, and continuing for six consecutive Sundays. His subject was "Christian Iconography and the Christian Religion in Antiquity."

The slide library of the Educational Office has a total of 41,989 slides in its permanent and lending collections. During the year 1,368 slides were added to the collections; 285 persons borrowed a total of 11,613 slides from the collections.

Members of the staff participated in activities outside the Gallery. Dr. Stites gave a total of 54 lectures in various cities throughout the country and in Washington, D.C., and wrote four magazine articles. Dr. Margaret Bouton, associate curator, gave a night course in the history of art at the American University, and Marcel Franciscono, docent, gave a night course in the history of art at George Washington University. The staff members prepared material for use by the volunteer docents and kept up the program of editing this material regularly. This material is also lent to slide borrowers and is sold with slide sets and photographs through the Publications Fund.

A printed calendar of events was prepared and distributed monthly to a mailing list of 7,553 names. Twenty-one new 13-minute radio talks were prepared and recorded by members of the staff for use during intermission of the broadcasts of the Gallery's Sunday evening concerts.

EXTENSION SERVICE

The Extension Service was separated from the Educational Office and placed under the supervision of Dr. Grose Evans, curator of the Index of American Design. This service circulates to the public the traveling exhibits, Gallery films, and slide lecture sets. There are 17 traveling exhibits in circulation, lent free of charge except for transportation charges. The exhibits were circulated 95 times and seen by approximately 46,000 viewers. There are three Gallery films in circulation; these have been lent 45 times during the year and seen by 12,200 persons. A total of 622 slide sets with texts on a variety of objects in the collection were lent 1,563 times and seen by 93,780 viewers.

This year the Extension Service reached approximately 151,980 viewers. Last year's estimated total was 67,480.

LIBRARY

During the year the library, under the supervision of Miss Ruth E. Carlson, acquisitioned 827 books and 655 pamphlets; 266 books, 40 pamphlets, 45 subscriptions to periodicals, and 2,178 photographs were purchased from private funds; Government funds were used to purchase 16 books and 24 subscriptions to periodicals, and for the binding of 114 volumes of periodicals. Gifts to the library included 460 books, and 407 pamphlets. The library acquired through exchange 85 books, 208 pamphlets, 1,572 periodicals, and 180 photographs.

The library cataloged and classified 1,343 publications, recorded 2,497 periodicals, filed 5,570 catalog cards, routed charges for 7,169 periodicals, and filed 3,012 book charges. This year the library sold 213 duplicate books, and 578 periodicals were sent to the U.S. Book Exchange. The library borrowed 1,409 books on interlibrary loan, 1,287 of these from the Library of Congress.

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, and for sale to the public. Approximately 8,191 photographs were stocked in the library during the year and 1,452 orders for 6,407 photographs were filled. There were 307 permits for reproduction of 767 subjects processed in the Library.

INDEX OF AMERICAN DESIGN

The work of the Index of American Design during the year was carried on under the direction of Dr. Grose Evans, curator. In all, 55 sets of color slides (2,750 slides) were circulated throughout the United States. The photographic files were increased by 51 negatives and 231 prints, and these photographs were used for exhibits as well as for study and to fill requests for publication. Twenty-seven permits to reproduce 121 subjects were issued. Approximately 429 visitors used Index material for purposes of research, publication, and design.

The curator continued to participate in the orientation program of the U.S.I.A. personnel, and also delivered lectures to club and school groups. Expert opinions were rendered to 10 persons. He also attended sessions of the Williamsburg Forum and the Alexandria Forum, and traveled to New England and three other cities to study American architecture and furnishings. In addition, Dr. Evans has been conducting a course for George Washington University, "The Story of Painting," on television, WTOP, since June 12, 1961, covering painting from the Cave Age to the present. The lectures are

divided into 45 sessions of one-half an hour, presented Monday, Wednesday, and Friday at 6:30 a.m.

MAINTENANCE OF THE BUILDING AND GROUNDS

The Gallery building, the mechanical equipment, and the grounds have been maintained at the established standards throughout the year.

The renewal program of all solid portions of the roof was completed.

The Phantasia marble borders in the East and West Garden Courts, which had raised and broken, were removed and replaced with a domestic marble, "Compania Rose." This does not require reinforcement by steel rods which were the primary cause of the failure of the Phantasia marble.

One of the elevators in the north lobby was converted from manual to automatic.

The Gallery greenhouse was operated to full capacity in providing flowering plants for the decoration of the Gallery throughout the year.

Fourteen hundred Gallery-grown landscape-size azaleas were replanted in redesigned beds on the grounds as substitutes for overgrown and nematode-infested small-leaf hollies and euonymous. The azaleas are effective as foliage plants throughout the year and give the landscaping additional color in spring and early summer.

Spreading Japanese yews were substituted for the nematode-damaged, small-leaf hollies on the south side of the building.

The experimental planting of various zoysia grasses continued in the Madison Drive and Seventh Street parkings and other exposed lawn areas.

LECTOUR

The Gallery's electronic guide system, Lectour, continued to be an effective tool for art education purposes. During the fiscal year 1961 Lectour was available in 20 different exhibition areas and was used by 74,487 visitors. It has been installed in 10 additional gallery rooms and broadcasts will be available to the public during the ensuing fiscal year.

Lectour broadcasts were prepared for special exhibitions of Civil War paintings, Italian drawings, and Chinese art treasures.

OTHER ACTIVITIES

Thirty-seven Sunday evening concerts were given in the East Garden Court. The National Gallery orchestra conducted by Richard Bales played 10 of these concerts. Two of the 10 concerts were made possible by the Music Performance Trust Fund of the American Federation of Musicians. In addition, a string orchestra conducted

by Richard Bales furnished music during the opening of the new Print Room and the Widener Rooms on October 8, 1960, and at the opening of the Civil War Exhibition on January 7, 1961. The concert on Sunday evening, October 23, 1960, was dedicated to United Nations Day and four Sunday evening concerts during May 1961 were devoted to the National Gallery of Art's 18th American Music Festival. All concerts were broadcast in their entirety in stereophonic sound by station WGMS, AM and FM. Intermission talks during these broadcasts were given by members of the Gallery's Educational Office.

During the year 8,059 copies of 16 press releases were approved and issued in connection with the various exhibitions and Gallery activities. A total of 138 permits to copy and 81 photographic permits were issued.

In response to requests 2,275 copies of the pamphlet "A Cordial Invitation from the Director," and 1,650 copies of the Gallery's Information Booklet were sent to members of the House and Senate for distribution to their constituents; and 26,225 copies of the pamphlet "A Cordial Invitation from the Director," and 2,655 copies of the Information Booklet were sent to various organizations holding conventions in Washington.

A total of 95 publications on the Gallery's collections and exhibitions were sent to various museums in accordance with the Exchange Program.

Henry B. Beville, the Gallery's photographer, and his staff processed 22,124 prints, 17,142 color slides, 570 black-and-white slides, 3,510 negatives, 558 color transparencies, 146 sets of color separation negatives, 5 infrared photographs, and 3 ultraviolet photographs during the fiscal year.

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, 1961, by Price Waterhouse & Co., public accountants, and the certificate of that company on its examination of the accounting records maintained for such funds will be forwarded to the Gallery.

Respectfully submitted,

HUNTINGTON CAIRNS, *Secretary.*

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

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, 1961:

As in the past the emphasis of the library has been on the providing of the literature and library services necessary for the promotion of the Smithsonian's various programs.

The number of items received by the library during the year was 67,275, including books, journals, pamphlets, microfilms, maps, photostats, and atlases. Of this total, 2,178 books were purchased, and subscriptions were placed for 675 scientific and technical journals. The balance of the materials came by exchange and gifts. The library's active exchange program, on a worldwide basis, continued to supply the journals, proceedings, and memoirs of scientific and learned societies which form the backbone of many of the library's collections. New exchanges established totaled 289, and 1,867 pieces were specifically requested to supply items missing from sets. A concentrated effort was made to bring the files of Russian journals up to date. Duplicate or ephemeral materials forwarded to other libraries amounted to 45,765 items including 41,159 sent to the Library of Congress.

Gifts from interested donors, many of them rare or out-of-print items, contributed to the library's resources. Some of the outstanding ones include:

A collection of 91 books and papers on pipes and smoking, from Dr. Leo Stoor, Cleveland, Ohio.

The Tatler, 1709–1711; the Lucubrations, vols. 1–4, by Isaac Bickerstaffe, Esq., London, 1749, from Mrs. Edward N. Townsend, Long Island, N.Y.

Atlas nouveau, by Sanson-Nicolas, Paris, 1692, from President John F. Kennedy.

Trees, Shrubs and Woody Vines of the Southwest, by Robert A. Vines. From the author, Texas University, Austin, Texas.

150 catalogs of medical instruments and apparatus, donated by the S. S. White Dental Co., Philadelphia, Pa.

American Heritage Picture History of the Civil War, 2 vols., donated by J. W. Eardesley, Washington, D.C.

Commemorative Biographical Record of New Haven County, Connecticut, J. H. Beers & Co., 1902. Donated by Claude Pearce, Arlington, Va.

Great Moments in News Photography, by John Faber. From Mr. Faber, Mountain Lakes, N.J.

Photochronograph and its Application, 1894, donated by Fr. Hayden of Georgetown College Observatory, Washington, D.C.

The Birds of California, by W. L. Dawson, 4 vols., donated by C. U. S. Roosevelt, Washington, D.C.

500 pieces of philatelic materials donated by Mrs. F. J. Shippen, Detroit, Mich.

14 volumes on American history, from Mrs. Arnold Miles, Washington, D.C.

The catalog section cataloged 7,983 volumes, recataloged 750 volumes, transferred 859 items, and checked in 31,443 periodicals. New procedures were adopted for the recording of serials in the serial record (formerly the periodical record). Because of more efficient methods of handling and processing, the recording of serials is on a current basis. The complete revamping of the serial record will result in still less time being required for checking of bibliographic data and for the recording of serials. This long-range project, which has had an excellent beginning, is one of the major steps in putting the library on an effective operating basis.

In cooperation with the Library of Congress the staff checked the library's serial holdings, which will be recorded in the third edition of the Union List of Serials. This bibliographic tool of national importance is used constantly by our staff.

The skilled hand binders repaired and restored 3,431 volumes of materials that required expert care and treatment, while 6,200 volumes of books and journals were prepared for binding or rebinding by a commercial binder. The continued program of weeding and discarding unused or duplicate materials from the collections resulted in 10,658 items being withdrawn.

The reference section answered a total of 32,094 reference and bibliographical requests, handled 2,840 pieces of correspondence that asked for specific types of information, and circulated 28,822 items. No record is kept of the circulation of books and journals assigned to the divisional libraries where they circulate freely within the division. Through interlibrary loans, 5,235 items were borrowed from other libraries, chiefly the Library of Congress; in addition, 935 pieces were lent. The facilities of the reading rooms in the main and branch libraries were used by 14,520 visitors, including many scholars and scientists. Floor plans were drawn by members of the staff for the library's expanded space which will ease the severely crowded stack and work areas.

The book collection that serves the staff of the Museum of History and Technology continued on a very active basis. Progress was seen in the growth and development of the collections and in the service provided. The staff answered 11,765 reference questions, replied to 894 letters, lent 12,599 publications, and assisted 3,982 persons coming to the library seeking specific types of information. One of the most significant achievements was the organization of 2,297 trade catalogs according to a special cataloging and classification scheme. With the addition of two temporary library assistants, good progress was made toward shaping the collection into a live, workable library. The shifting of the old card catalog into a new one and the cataloging of the collection of books on the history of medicine were completed. The preparation and distribution of a bimonthly accession list has

fulfilled a long-felt need to inform members of the Museum staff of new library acquisitions.

The library for the Smithsonian Astrophysical Observatory began operation on a full-time basis this past year. New equipment has been installed and an active acquisitions program is under way to supply library materials. Many problems are to be resolved before this library can become fully effective.

The library staff continued to translate into English miscellaneous items in foreign languages which were referred to the library for translation. The Institution's participation in the National Science Foundation Russian translation program has resulted in the publishing of one volume: "Musk Deer and Deer," by K. K. Flerov.

Members of the staff continued active membership and participation in the Special Libraries Association and the American Library Association, with representation at the annual conventions of both organizations. The librarian continued as the Smithsonian representative on the U.S. Book Exchange. During the year, members of the staff visited the Smithsonian Astrophysical Observatory library, Cambridge, Mass., the Harvard University libraries, and the Canal Zone Biological Area library at Barro Colorado Island.

Librarians from other research organizations and museums both in the United States and in other countries visited the library, the publications distribution section, and the International Exchange Service for the exchange of professional knowledge and publications.

In spite of difficulties, the library has had a fruitful year. The addition of temporary staff eased the flow of work in some areas.

SUMMARIZED STATISTICS

ACCESSIONS

	Volumes	Total recorded volumes, 1961
Smithsonian main library (including the Natural History Museum)	2,671	340,349
Museum of History and Technology	8,241	
Astrophysical Observatory (including Smithsonian Astrophysical Observatory, Cambridge, Mass.)	212	13,612
Radiation and Organisms (formerly counted with the Astrophysical Observatory)	82	1,869
Bureau of American Ethnology	629	38,891
National Air Museum	107	816
National Collection of Fine Arts	68	14,305
National Zoological Park	3	4,296
Total	12,013	414,138

Unbound volumes of periodicals and reprints and separates from serial publications, of which there are many thousands, have not been included in these totals.

EXCHANGES

New exchanges arranged	289
Specially requested publications received	1,867

CATALOGING

Volumes cataloged	12,763
Catalog cards filed	59,795

PERIODICALS

Periodical parts entered	31,443

CIRCULATION

Loans of books and periodicals	28,822

Circulation in the divisional libraries is not counted except in the Division of Insects.

BINDING AND REPAIR

Volumes sent to the bindery	6,200
Volumes repaired in the library	3,431

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, 1961:

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 a guidebook, a picture pamphlet, postcards and a postcard folder, a color-picture album, 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 for sale to visitors. Through its publication program the Smithsonian endeavors to carry out its founder's expressed desire for the diffusion of knowledge.

During the year the Institution published 10 Smithsonian Miscellaneous Collections papers; 1 Annual Report of the Board of Regents and separates of 24 articles in the General Appendix; 1 Annual Report of the Secretary; 4 special publications; and reprints of 3 special publications and 2 popular publications.

The U.S. National Museum issued 1 Annual Report, 4 bulletins, 1 paper in the series Contributions from the U.S. National Herbarium, 7 papers in the series Contributions from the Museum of History and Technology, and 21 Proceedings papers.

The Bureau of American Ethnology issued 1 Annual Report and 2 Bulletins.

The Astrophysical Observatory issued 8 papers in the series Smithsonian Contributions to Astrophysics.

The National Collection of Fine Arts published 1 catalog, and the Smithsonian Traveling Exhibition Service, under the National Collection of Fine Arts, published 4 catalogs and 3 folders.

The Freer Gallery of Art issued one brochure and volume 4 of Ars Orientalis.

DISTRIBUTION

In all, 774,444 copies of publications and miscellaneous items were distributed. *Publications:* 141 Contributions to Knowledge, 28,606 Smithsonian Miscellaneous Collections, 7,838 Annual Report volumes and 22,795 pamphlet copies of Report separates, 44,307 special publications, 87 reports of the Harriman Alaska Expedition; 66,722 publications of the National Museum; 29,845 publications of the Bureau of American Ethnology; 18,424 publications of the National Collection of Fine Arts; 150 publications of the Freer Gallery of Art;[1] 15,145 publications of the Astrophysical Observatory; 384 War Background Studies; 1,582 reports of the American Historical Association; and 6,231 publications not issued by the Smithsonian Institution. Miscellaneous: 7 sets of North American Wild Flowers and 45 North American Wild Flower prints, 2 Pitcher Plant volumes, 56,666 Guide Books, 18,663 picture pamphlets, 336,199 postcards and postcard folders, 19,963 color slides, 97,740 information leaflets, 10 New Museum of History and Technology pamphlets, 443 statuettes, 2,379 Viewmaster reels, and 1 filmstrip.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

In this series, under the immediate editorship of Miss Ruth B. MacManus, there were issued 10 papers as follows:

Volume 139

No. 10. Water transparency observations along the east coast of North America, by Jerome Williams, E. R. Fenimore Johnson, and Albert C. Dyer. 181 pp., 2 pls., 13 maps. (Publ. 4391.) Oct. 26, 1960. ($2.50.)

Volume 140

No. 2. Pleistocene birds in Bermuda, by Alexander Wetmore. 11 pp., 3 pls. (Publ. 4423.) July 7, 1960. (40 cents.)

No. 3. Doctor Langley's paradox: Two letters suggesting the development of rockets, by Russell J. Parkinson. 4 pp., 3 pls. (Publ. 4424.) Aug. 31, 1960. (50 cents.)

No. 4. The cephalic nervous system of the centipede *Arenophilus bipuncticeps* (Wood) (Chilopoda. Geophilomorpha, Geophilidae), by Michael A. Lorenzo. 43 pp., 5 pls., 5 figs. (Publ. 4425.) Nov. 8, 1960. (75 cents.)

No. 5. A revision of the Ordovician bryozoan genera *Batostoma*, *Anaphragma*, and *Amplexopora*, by Richard S. Boardman. 28 pp., 7 pls. (Publ. 4426.) Dec. 15, 1960. (75 cents.)

Volume 141

The biotic associations of cockroaches, by Louis M. Roth and Edwin R. Willis. 470 pp., 37 pls., 7 figs. (Publ. 4422) Dec. 2, 1960. ($7.50.)

---

[1] In addition to those distributed by the Gallery itself.

Volume 142

No. 1. Facts and theories concerning the insect head, by R. E. Snodgrass. 66 pp., 21 figs. (Publ. 4427.) Nov. 4, 1960. (75 cents.)

No. 3. Some osteological features of modern lower teleostean fishes, by William A. Gosline. 42 pp., 8 figs., 4 diagrams. (Publ. 4458.) June 12, 1961. (50 cents.)

Volume 143

No. 1. Some locomotor mechanisms of birds, by Frank A. Hartman. 91 pp., 7 figs. (Publ. 4460.) June 15, 1961. ($2.00.)

No. 2. Sixteen-day weather forecasts from satellite observations, by C. G. Abbot. 6 pp. (Publ. 4462.) May 26, 1961. (25 cents.)

SMITHSONIAN ANNUAL REPORTS

REPORT FOR 1959

The complete volume of the Annual Report of the Board of Regents for 1959 was received from the printer on December 22, 1960:

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, 1959. x+ 693 pp., 86 pls., 125 figs., 1 map. (Publ. 4392.)

The general appendix contained the following papers (Publ. 4393-4416):

The transuranium elements, by Glenn T. Seaborg.

The IGY in retrospect, by Elliott B. Roberts.

Astronomy from artificial satellites, by Leo Goldberg.

Solar radio astronomy, by Alan Maxwell.

The new uses of the abstract, by George A. W. Boehm.

Mirages, by James H. Gordon.

Lessons from the history of flight, by Grover Loening.

The use of oceanography, by G. E. R. Deacon.

Ambergris—Neptune's treasure, by C. P. Idyll.

The rhythmic nature of animals and plants, by Frank A. Brown, Jr.

The survival of animals in hot deserts, by E. B. Edney.

Amphibians, pioneers of terrestrial breeding habits, by Coleman J. Goin.

A study of saturniid moths in the Canal Zone Biological Area, by A. D. Blest.

Evolution of knowledge concerning the roundworm *Ascaris lumbricoides*, by Benjamin Schwartz.

The protection of fauna in the U.S.S.R., by G. P. Dementiev.

Reconstructing the ancestor of corn, by Paul C. Mangelsdorf.

The need to classify, by Roger L. Batten.

Current advances and concepts in virology, by staff members of Lilly Research Laboratories.

In search of a home: From the Mutiny to Pitcairn Island (1789–1790), by H. E. Maude.

The Chinook sign of freedom: A study of the skull of the famous chief Comcomly, by T. D. Stewart.

The Muldbjerg dwelling place: An early Neolithic archeological site in the Aamosen Bog, West Zealand, Denmark, by J. Troels-Smith.

Three adult Neanderthal skeletons from Shanidar Cave, northern Iraq, by Ralph S. Solecki.

Sumerian technology, by Ida Bobula.

Brandywine: An early flour-milling center, by Peter C. Welsh.

REPORT FOR 1960

The Report of the Secretary, which will form part of the Annual Report of the Board of Regents, was issued January 15, 1961:

Report of the Secretary and financial report of the Executive Committee of the Board of Regents for the year ended June 30, 1960. x+225 pp., 10 pls., 1 map. (Publ. 4429.)

SPECIAL PUBLICATIONS

Lichen handbook, by Mason E. Hale. 178 pp., 20 pls., 58 figs. (Publ. 4434.) [June] 1961. ($4.00.)

The Victorian American. Lithographs from the Harry T. Peters *America on Stone* collection, by Anthony N. B. Garvan and Peter C. Welsh. 30 pp., 21 pls. (Publ. 4466.) [May] 1961. ($1.00.)

Uniform regulations for the Army of the United States (1861), by Edgar M. Howell. 61 pp., incl. 36 pls. (Publ. 4467.) [June] 1961. ($1.00.)

REPRINTS

The Smithsonian Institution. (Revised.) 49 pp., illustr. (Publ. 4145.) [April] 1961. (50 cents.)

Masters of the air. (Revised.) 31 pp., illustr. (Publ. 4183.) [June] 1961. (50 cents.)

The world of the dinosaurs, by David H. Dunkle. 22 pp., illustr. (Publ. 4296.) [November] 1960, and [April] 1961. (50 cents.)

Anthropology as a career, by William C. Sturtevant. (Revised.) 20 pp. (Publ. 4343.) [October] 1960, and [January] 1961. (20 cents.)

Brief guide to the Smithsonian Institution. (Revised.) 82 pp., illustr. [March] 1961. (25 cents.)

Trees and shrubs of Mexico (including reprints of Parts 1–3 and 5 of volume 25, Contributions from the United States National Herbarium). In 2 parts. 1: pp. xviii+1–170, xxxvii+171–515, xxviii+517–848. 2: pp. 1313–1721. (Publ. 4461.) Apr. 28, 1961. ($20.00.)

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, 1960. Pp. vi+175, illus., January 13, 1961.

BULLETINS

219. The national watercraft collection, by Howard I. Chapelle. Pp. xi+327, 204 figs. Nov. 23, 1960.

220. Type specimens of reptiles and amphibians in the U.S. National Museum, by Doris M. Cochran. Pp. xv+291. Apr. 4, 1961.

221. Type specimens of birds in the United States National Museum, by Herbert G. Deignan. Pp. x+718. Mar. 17, 1961.

223. The parasitic weaverbirds, by Herbert Friedmann. Pp. viii+196, 3 figs., 16 pls. (4 color), Dec. 30, 1960.

225. Contributions from the Museum of History and Technology, Papers 12–16, by members of the staff and others:

Paper 12. Hermann Stieffel, soldier-artist of the West, by Edgar M. Howell. Pp. 1–16, 11 figs. July 8, 1960.

Paper 13. North Devon pottery and its export to America in the 17th century, by C. Malcolm Watkins. Pp. 17–60, 36 figs. (1 color). Dec. 30, 1960.

Paper 14. Tea drinking in 18th-century America: Its etiquette and equipage, by Rodris Roth. Pp. 61–91, 22 figs., 1 color pl. Jan. 30, 1961.

Paper 15. Italian harpsichord-building in the 16th and 17th centuries, by John D. Shortridge. Pp. 93–107, 12 figs. Dec. 15, 1960.

Paper 16. Drug supplies in the American Revolution, by George B. Griffenhagen. Pp. 109–133, 4 figs. Mar. 9, 1961.

228. Contributions from the Museum of History and Technology, Papers 19 and 20, by members of the staff and others.

Paper 19. Elevator systems of the Eiffel Tower, 1889, by Robert M. Vogel. Pp. 1–40, 41 figs. Feb. 21, 1961.

Paper 20. John Ericsson and the age of caloric, by Eugene S. Ferguson. Pp. 41–60, 11 figs. Jan. 25, 1961.

CONTRIBUTIONS FROM THE NATIONAL HERBARIUM

Volume 35

Part 2. A taxonomic revision of the Humiriaceae, by José Cuatrecasas. Pp. iii+25–214, 38 figs., 24 pls. Apr. 14, 1961.

PROCEEDINGS

Volume 110

Title page, table of contents, and index. Pp. i–iii, 599–619, August 19, 1960.

Volume 111

No. 3429. A revision of the genus *Ogcodes* Latreille with particular reference to species of the Western Hemisphere, by Evert I. Schlinger. Pp. 227–336, 9 figs., 13 pls. Sept. 9, 1960.

No. 3430. Cydnidae of the Western Hemisphere, by Richard C. Froeschner. Pp. 337–680, 13 pls. Oct. 25, 1960.

Title page, table of contents, and index. Pp. i–iv, 681–692. Mar. 15, 1961.

Volume 112

No. 3431. Lace-bug genera of the world (Hemiptera: Tingidae), by Carl J. Drake and Florence A. Ruhoff. Pp. 1–105, 5 figs., 9 pls. July 7, 1960.

No. 3436. Revision of the milliped genus *Cherokia* (Polydesmida: Xystodesmidae), by Richard L. Hoffman. Pp. 227–264, 7 figs., 1 pl. Oct. 12, 1960.

No. 3437. Reexamination of species of Protura described by H. E. Ewing, by F. Bonet and S. L. Tuxen. Pp. 265–305, 103 figs. Oct. 13, 1960.

No. 3438. Studies in neotropical Mallophaga, XVII: A new family (Trochiliphagidae) and a new genus of the lice of hummingbirds, by M. A. Carriker, Jr. Pp. 307–342, 12 figs. Oct. 13, 1960.

No. 3439. The pelagic amphipod genus *Parathemisto* (Hyperiidea: Hyperiidae) in the North Pacific and adjacent Arctic Ocean, by Thomas E. Bowman. Pp. 343–392, 19 figs. Oct. 13, 1960.

No. 3440. Assassin bugs of the genus *Ghilianella* in the Americas (Hemiptera, Reduviidae, Emesinae), by J. Maldonado-Capriles. Pp. 393–450, 146 figs. Sept. 9, 1960.

No. 3441. Welcome Mound and the effigy pipes of the Adena people, by Frank M. Setzler. Pp. 451–458, 1 fig., 4 pls. Sept. 9, 1960.

No. 3442. Descriptions of new bats from Panama, by Charles O. Handley, Jr. Pp. 459–479. Oct. 6, 1960.

No. 3443. Cultural sequences in Hokkaido, Japan, by Lt. Col. Howard A. MacCord. Pp. 481–503, 5 figs., 14 pls. Dec. 5, 1960.

No. 3444. Noctuid moths of the Scopulepes group of *Hemeroplanis* Hübner, by E. L. Todd. Pp. 505–515, 6 figs., 1 pl. Sept. 13, 1960.

No. 3445. *Lithoglyptes spinatus*, a burrowing barnacle from Jamaica, by Jack T. Tomlinson and William A. Newman. Pp. 517–526, 10 figs. Dec. 20, 1960.

No. 3446. Notes on Mysidacean crustaceans of the genus *Lophogaster* in the U.S. National Museum, by O. S. Tattersall. Pp. 527–547, 7 figs. Dec. 20, 1960.

No. 3447. The fairy shrimp *Brachinecta campestris* from Northwestern United States (Crustacea: Phyllopoda), by James E. Lynch. Pp. 549–561, 5 figs. Dec. 5, 1960.

No. 3448. Stargazer fishes from the western North Atlantic (family Uranoscopidae), by Frederick H. Berry and William W. Anderson. Pp. 563–586, 1 fig., 4 pls. Apr. 12, 1961.

Volume 113

No. 3450. *Paraconger*, a new genus with three new species of eels (family Congridae), by Robert H. Kanazawa. Pp. 1–14, 3 figs., 2 pls. Jan. 26, 1961.

No. 3451. Revision of the milliped genus *Deltotaria* (Polydesmida: Xystodesmidae), by Richard L. Hoffman. Pp. 15–35, 4 figs. Mar. 17, 1961.

No. 3452. Four new species of *Pseudocyclops* (Copepoda: Calanoida), from Puerto Rico, by Thomas E. Bowman and Juan G. González. Pp. 37–59, 11 figs. Mar. 20, 1961.

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:

ANNUAL REPORT

Seventy-seventh Annual Report of the Bureau of American Ethnology, 1959–60. ii+35 pp., 2 pls. 1961.

BULLLETINS

Bulletin 176. River Basin Surveys Papers, Nos. 15–20, Frank H. H. Roberts, Jr., editor. ix+337 pp., 65 pls., 25 figs. 1960.

No. 15. Historic sites archeology on the Upper Missouri, by Merrill J. Mattes.

No. 16. Historic sites archeology in the Fort Randall Reservoir, South Dakota, by John E. Mills.

No. 17. The excavation and investigation of Fort Lookout Trading Post II (39LM57) in the Fort Randall Reservoir, South Dakota, by Carl F. Miller.

No. 18. Fort Pierre II (39ST217), a historic trading post in the Oahe Dam area, South Dakota, by G. Hubert Smith.

No. 19. Archeological investigations at the site of Fort Stevenson (32ML1), Garrison Reservoir, North Dakota, by G. Hubert Smith. With an introduction by Robert L. Stephenson and an appendix by Carlyle S. Smith.

No. 20. The archeology of a small trading post (Kipp's Post, 32MN1) in the Garrison Reservoir, North Dakota, by Alan R. Woolworth and W. Raymond Wood.

Bulletin 180. Symposium on Cherokee and Iroquois culture, edited by William N. Fenton and John Gulick. vi+292 pp. 1961.

No. 1. Foreword by the editors.

No. 2. Iroquois-Cherokee linguistic relations, by Floyd G. Lounsbury.

No. 3. Comment on Floyd G. Lounsbury's "Iroquois-Cherokee Linguistic Relations," by Mary R. Haas.

No. 4. Iroquois archeology and settlement patterns, by William A. Ritchie.

No. 5. First comment on William A. Ritchie's "Iroquois Archeology and Settlement Patterns," by William H. Sears.

No. 6. Second comment on William A. Ritchie's "Iroquois Archeology and Settlement Patterns," by Douglas S. Byers.

No. 7. Cherokee archeology, by Joffre L. Coe.

No. 8. Comment on Joffre L. Coe's "Cherokee Archeology," by Charles H. Fairbanks.

No. 9. Eastern Woodlands community typology and acculturation, by John Witthoft.

No. 10. Comment on John Witthoft's "Eastern Woodlands Community Typology and Acculturation," by John M. Goggin.

No. 11. Cherokee economic cooperatives: the Gadugi, by Raymond D. Fogelson and Paul Kutsche.

No. 12. The rise of the Cherokee state as an instance in a class: The "Mesopotamian" career to statehood, by Fred O. Gearing.

No. 13. Comment on Fred O. Gearing's "The Rise of the Cherokee State as an Instance in a Class: The 'Mesopotamian' Career to Statehood," by Annemarie Shimony.

No. 14. Cultural composition of the Handsome Lake Religion, by Anthony F. C. Wallace.

No. 15. Comment on Anthony F. C. Wallace's "Cultural Composition of the Handsome Lake Religion," by Wallace L. Chafe.

No. 16. The Redbird Smith Movement, by Robert K. Thomas.

No. 17. Comment on Robert K. Thomas's "The Redbird Smith Movement," by Fred W. Voget.

No. 18. Effects of environment on Cherokee-Iroquois ceremonialism, music, and dance, by Gertrude P. Kurath.

No. 19. Comment on Gertrude P. Kurath's "Effects of Environment on Cherokee-Iroquois Ceremonialism, Music, and Dance," by William C. Sturtevant.

No. 20. The Iroquois fortunetellers and their conservative influence, by Annemarie Shimony.

No. 21. Change, persistence, and accommodation in Cherokee medico-magical beliefs, by Raymond D. Fogelson.

No. 22. Some observations on the persistence of aboriginal Cherokee personality traits, by Charles H. Holzinger.

No. 23. First comment on Charles H. Holzinger's "Some Observations on the Persistence of Aboriginal Cherokee Personality Traits," by David Landy.

No. 24. Second comment on Charles H. Holzinger's "Some Observations on the Persistence of Aboriginal Cherokee Personality Traits, by John Gulick.

No. 25. Iroquoian culture history: A general evaluation, by William N. Fenton.

609118—61——16

PUBLICATIONS OF THE ASTROPHYSICAL OBSERVATORY

The editorial work of the Smithsonian Astrophysical Observatory continued under the immediate direction of Ernest E. Biebighauser. The year's publications in the series Smithsonian Contributions to Astrophysics are as follows:

Volume 4

No. 2. Orbital elements of photographic meteors, by Richard E. McCrosky and Annette Posen. Pp. 15–84, 19 figs. 1961.

No. 3. Orbital elements of meteors, by Gerald S. Hawkins and Richard B. Southworth. Pp. 85–95. 1961.

No. 4. Precision orbits of 413 photographic meteors, by Luigi G. Jacchia and Fred L. Whipple. Pp. 97–129, 6 figs. 1961.

Volume 5

No. 4. Observations of simulated meteors, by Richard E. McCrosky. Pp. 29–37, 3 figs. 1961.

No. 5. On the motion of satellites with critical inclination: Libration of an earth satellite with critical inclination, by Yusuke Hagihara, pp. 39–51, 3 figs.; Motion of a particle with critical inclination in the gravitational field of a spheroid, by Yoshihide Kozai, pp. 53–58, 1 fig. 1961.

No. 6. Gaps in the distribution of asteroids, by Yusuke Hagihara. Pp. 59–67, 2 figs. 1961.

No. 7. Major flares and geomagnetic activity, by Barbara Bell. Pp. 69–83, 13 figs. 1961.

No. 8. An annotated bibliography of interplanetary dust, by Paul W. Hodge, Frances W. Wright, and Dorrit Hoffleit. Pp. 85–111. 1961.

PUBLICATIONS OF THE NATIONAL COLLECTION OF FINE ARTS

Art and archeology of Viet Nam, Asian crossroad of cultures. 63 pp., illustr. 1960. (Publ. 4430.) ($1.00.)

Italian drawings. 78 pp., 42 ills. 1960.

Irish architecture of the Georgian period. 17 pp., illustr. 1960.

The world of Werner Bischof. 12 pp., 48 ills. 1961.

Smithsonian Institution Traveling Exhibitions. 1961–1962 catalog. 40 pp.

Three folders: Sardinian crafts, New exhibitions, and Architectural exhibitions.

PUBLICATIONS OF THE FREER GALLERY OF ART

Ars Orientalis, vol. IV. (17 articles by various authors, 5 notes, 21 book reviews, 2 obituaries, 1 bibliography.) 462 pp., 143 pls., 61 text figs. [June] 1961.

Second presentation of the Charles Lang Freer Medal. (A brochure issued in connection with the presentation of the medal to Prof. Ernst Kühnel, May 3, 1961.)

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 1959. Vol. 1. Proceedings. 1960.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN REVOLUTION

In accordance with law, the manuscript of the sixty-third annual report of the National Society, Daughters of the American Revolution, was transmitted to Congress on March 13, 1961.

OTHER ACTIVITIES

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. He also represented the Institution at the annual meeting of the Association of American University Presses held early in May at Oklahoma City and Norman, Okla.

PAUL H. OEHSER,
Chief, Editorial and Publications Division.

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Other Activities

LECTURES

In 1931 the Institution received a bequest from James Arthur, of New York City, a part of the income from which was to be used to endow an annual lecture on some aspect of the sun. The 27th Arthur lecture was delivered in the auditorium of the Natural History Building on the evening of February 2, 1961, by Dr. Herbert Friedman, Superintendent of the Atmosphere and Astrophysics Division of the U.S. Naval Research Laboratory. This lecture will be published in full in the general appendix of the Annual Report of the Board of Regents of the Smithsonian Institution for 1961.

Dr. Erik Sjoqvist, of the Department of Art and Archaeology of Princeton University, delivered a lecture on "Morgantina, an Unknown Greek City in Sicily" in the auditorium of the Natural History Building on the evening of January 24, 1961. This was sponsored jointly by the Smithsonian and the Archaeological Institute of America.

Alfred Friendly, managing editor of the *Washington Post*, lectured on "Bushman Paintings" in the Freer Gallery of Art auditorium on the evening of May 10, 1961.

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.

Many other lectures on technical subjects were given at the Institution during the year.

SCIENCE INFORMATION EXCHANGE

The Science Information Exchange, an agency operated within the Smithsonian Institution, is a clearinghouse for current scientific research in process. The basic purpose of the Exchange is to foster and facilitate effective planning and management of scientific research activities supported by United States agencies and institutions by promoting the exchange among participating agencies of administrative data about all types of current research. Thus the Exchange provides a means of communication concerning on-going research which precedes publication of research findings, and which prevents unknowing duplication.

Abstracts of research-in-process have been for some years registered by investigators engaged in biological, medical, and psycho-

logical research and in limited aspects of research in the social sciences. Through an extensive system of subject indexing, these abstracts are provided upon request and without charge to research institutions. For granting agencies and properly constituted committees it prepares extensive surveys of research in broad areas.

In September 1960 the Governing Board of the Bio-Sciences Information Exchange (the name of the agency as originally organized in 1950) was reconstituted as the Governing Board, Science Information Exchange, to reflect the inclusion of the physical sciences in the scope of the operation. Dr. Orr E. Reynolds, of the Department of Defense, was elected chairman. An ad hoc committee for the physical sciences was established under the chairmanship of Dr. Urner Liddel, and recruitment for professional staff in the physical sciences began.

The volume of registration and of use of the Exchange in the field of the life sciences has continued to grow, and it is believed that similar volume and use for the physical sciences will develop. It is expected that the actual scope of coverage and service, by subject matter and by types of research projects, will evolve and expand gradually.

A systems survey by Booz, Allen, and Hamilton was begun in November 1960 and completed in May 1961. Consultant services by the Computer Usage Corporation have assisted in the orderly conversion to magnetic tape and in formulating plans for expanded activities.

An associate director for the life sciences, Dr. David Hersey, was selected but will not enter on duty until the next fiscal year.

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 volunteer docents of the Junior League of Washington, D.C. A more complete report of this activity, directed by G. Carroll Lindsey, curator, is carried in the Report of the United States National Museum.

The Museum Service provided assistance to professional and subprofessional 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 university 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. Arrangements were made through the Museum Service for Smithsonian participation in the Workshop on Community Resources

sponsored by the University of Maryland. Through the facilities of this workshop, a five-day program outlining the history of the Institution and the work of the various Smithsonian museum and research bureaus was presented to 40 graduate students from the University of Maryland. This workshop has, since its inception in 1958, provided an opportunity for more than 150 local school teachers and university faculty members to become acquainted with cultural resources of the Institution of value in school curricula.

The Museum Service cooperated with the Greater Washington Educational Television Association in the preparation of a half-hour educational television presentation based on the early musical instrument collection of the Smithsonian.

Through the Museum Service distribution of certain duplicate specimens and objects from the United States National Museum was made to the Overbrook School for the Blind for use in that school's training of blind children. Special "touch" exhibits and demonstrations were arranged for visiting groups of children from the Columbia Lighthouse for the Blind.

The program for visitor orientation to Smithsonian museums and exhibits was continued through the installation of another electronically controlled slide lecture device in the Lobby of the Museum of Natural History. Floor diagrams showing exhibit locations and listings of exhibits and location of each were installed in the Museum of Natural History.

Arrangements for various Smithsonian public functions and events including lectures, films, and the opening of new halls and exhibits were made by the Museum Service. More complete information about these activities will be found under appropriate headings elsewhere in the Annual Report of the Secretary of the Smithsonian Institution. 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.

Report of the Executive Committee of the Board of Regents of the Smithsonian Institution

For the Year Ended June 30, 1961

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:

	Unrestricted funds	*Income 1961*
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
Total	889, 000	53, 340. 00

	Restricted funds	
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 $3,871,350.59 which has been invested. Of this sum, $3,734,-473.88 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 1961	Income 1961
Abbott, W. L., Special	$21, 344. 95	$1, 100. 60
*Avery, Robert S., and Lydia	56, 590. 75	2, 917. 95
Gifts, royalties, gain on sale of securities	395, 583. 11	20, 397. 09
Hachenberg, George P. and Caroline	5, 761. 97	297. 09
*Hamilton, James	578. 35	29. 84
Hart, Gustavus E.	697. 84	36. 00
Henry, Caroline	1, 732. 75	89. 37
Henry, Joseph and Harriet A.	70, 231. 84	3, 621. 31
*Hodgkins, Thomas G. (General)	43, 399. 98	2, 237. 79
Morrow, Dwight W.	110, 789. 10	5, 712. 49
Olmsted, Helen A.	1, 148. 62	59. 21
*Poore, Lucy T. and George W.	233, 177. 42	12, 023. 11
Porter, Henry Kirke	410, 317. 07	21, 156. 85
*Rhees, William Jones	677. 83	34. 94
*Sanford, George H.	1, 275. 36	65. 74
*Smithson, James	1, 749. 06	90. 16
Taggart, Gansen	512. 44	22. 14
Witherspoon, Thomas A.	184, 890. 65	9, 533. 36
Total	1, 540, 459. 09	79, 425. 04

* In addition to funds deposited in the United States Treasury.

CONSOLIDATED FUND

(Income restricted to specific use)

Fund	Investment 1961	Income 1961
Abbott, William L., for investigations in biology	$149, 362. 74	$7, 675. 50
Armstrong, Edwin James, for use of Department of Invertebrate Paleontology when principal amounts to $5,000.00	1, 710. 21	70. 78

CONSOLIDATED FUND—Continued

Fund	Investment 1961	Income 1961
Arthur, James, for investigations and study of the sun and annual lecture on same	57, 298. 65	2, 954. 43
Bacon, Virginia Purdy, for traveling scholarship to investigate fauna of countries other than the United States	71, 779. 58	3, 701. 12
Baird, Lucy H., for creating a memorial to Secretary Baird	34, 495. 02	1, 778. 64
Barney, Alice Pike, for collection of paintings and pastels and for encouragement of American artistic endeavor	41, 092. 28	2, 118. 80
Barstow, Frederick D., for purchase of animals for Zoological Park	1, 432. 35	73. 86
Canfield collection, for increase and care of the Canfield collection of minerals	54, 796. 73	2, 825. 45
Casey, Thomas L., for maintenance of the Casey collection and promotion of researches relating to Coleoptera	17, 958. 19	925. 96
Chamberlain, Francis Lea, for increase and promotion of Isaac Lea Collection of gems and mollusks	40, 345. 65	2, 080. 30
Dykes, Charles, for support in financial research	61, 682. 94	3, 180. 48
Eickemeyer, Florence Brevoort, for preservation and exhibition of the photographic collection of Rudolph Eickemeyer, Jr	15, 572. 70	802. 97
Hanson, Martin Gustav and Caroline Runice, for some scientific work of the Institution, preferably in chemistry or medicine	12, 736. 57	656. 74
Higbee, Harry, income for general use of the Smithsonian Institution after June 11, 1967	26. 69	. 48
Hillyer, Virgil, for increase and care of Virgil Hillyer collection of lighting objects	9, 415. 97	485. 49
Hitchcock, Albert S., for care of the Hitchcock Agrostological Library	2, 260. 72	116. 55
Hrdlička, Aleš and Marie, to further researches in physical anthropology and publication in connection therewith	68, 539. 55	3, 360. 75
Hughes, Bruce, to found Hughes alcove	27, 423. 90	1, 414. 05
Loeb, Morris, for furtherance of knowledge in the exact sciences	124, 864. 24	6, 438. 27
Long, Annette and Edith C., for upkeep and preservation of Long collection of embroideries, laces, and textiles	777. 91	40. 09
Maxwell, Mary E., for care and exhibition of Maxwell collection	28, 101. 35	1, 448. 94
Myer, Catherine Walden, for purchase of first-class works of art for use and benefit of the National Collection of Fine Arts	28, 939. 20	1, 492. 16
Nelson, Edward W., for support of biological studies	31, 861. 40	1, 642. 86

CONSOLIDATED FUND—Continued

Fund	Investment 1961	Income 1961
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, 376. 47	70. 99
Pell, Cornelia Livingston, for maintenance of Alfred Duane Pell collection	10, 619. 83	547. 57
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	10, 621. 07	574. 62
Rathbun, Richard, for use of division of U.S. National Museum containing Crustacea	15, 238. 20	785. 72
*Reid, Addison T., for founding chair in biology, in memory of Asher Tunis	25, 483. 68	1, 314. 01
Roebling Collection, for care, improvement, and increase of Roebling collection of minerals	172, 910. 49	8, 915. 65
Roebling Solar Research	33, 028. 76	1, 703. 02
Rollins, Miriam and William, for investigations in physics and chemistry	198, 652. 57	9, 985. 51
Smithsonian employees' retirement	33, 655. 55	1, 766. 50
Springer, Frank, for care and increase of the Springer collection and library	25, 692. 44	1, 324. 74
Strong, Julia D., for benefit of the National Collection of Fine Arts	14, 324. 85	738. 62
Walcott, Charles D. and Mary Vaux, for development of geological and paleontological studies and publishing results of same	685, 644. 88	35, 318. 99
Walcott, Mary Vaux, for publications in botany	82, 932. 44	4, 276. 19
Younger, Helen Walcott, held in trust	104, 571. 77	5, 122. 45
Zerbee, Francis Brinckle, for endowment of aquaria	1, 359. 02	70. 09
Total	2, 298, 586. 56	117, 772. 34

* 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 endow-

ment fund for the operation of the Gallery. The fund now amounts to $9,721,210.13.

SUMMARY OF ENDOWMENTS

Invested endowment for general purposes	$2,429,459.09
Invested endowment for specific purposes other than Freer endowment	2,441,891.50
Total invested endowment other than Freer	4,871,350.59
Freer invested endowment for specific purposes	9,721,210.13
Total invested endowment for all purposes	$14,592,560.72

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	$1,530,633.40	
Stocks	2,295,685.77	
Real estate and mortgages	28,756.00	
Uninvested capital	16,275.42	
		3,871,350.59
Total investments other than Freer endowment		$4,871,350.59
Investments of Freer endowment (cost or market value at date acquired):		
Bonds	$4,993,135.06	
Stocks	4,724,660.49	
Uninvested capital	3,414.58	
		9,721,210.13
Total investments		$14,592,560.72

EXHIBIT A

BALANCE SHEET OF PRIVATE FUNDS

June 30, 1961

ASSETS

Current funds:			
General:			
Cash:			
United States Treasury current account			$510,434.04
In banks and on hand			355,166.47
			865,600.51
Less uninvested endowment			19,690.00
			845,910.51
Travel and other advances			12,724.00
Total general funds			858,634.51
Restricted:			
Cash—United States Treasury current account		$1,738,733.99	
Investments—United States Treasury Notes		1,635,712.56	
Total restricted funds			3,374,446.55
Total current funds			4,233,081.06
Endowment funds and funds functioning as endowment:			
Investments:			
Freer Gallery of Art:			
Cash		$3,414.58	
Stocks and bonds		9,717,795.55	
		9,721,210.13	
Consolidated:			
Cash	$15,709.70		
Stocks and bonds	3,718,764.18		
	3,734,473.88		
Loan to United States Treasury	1,000,000.00		
Other stocks and bonds	107,554.99		
Cash	565.72		
Real estate at book value	28,756.00	4,871,350.59	
Total endowment funds and funds functioning as endowment			14,592,560.72
Total			18,825,641.78

FUND BALANCES

Current funds:			
General:			
Unexpended funds—unrestricted			858, 634. 51
Total general funds			858, 634. 51
Restricted (Exhibit C):			
Unexpended income from endowment		$1, 084, 076. 28	
Funds for special purposes (gifts, grants, etc.)		2, 290, 370. 27	
Total restricted funds			3, 474, 446. 55
Total current funds			4, 233, 081. 06
Endowment funds and funds functioning as endowment (Exhibit D):			
Freer Gallery of Art		$9, 721, 210. 13	
Other:			
Restricted	$2, 441, 891. 50		
General	2, 429, 459. 09	4, 871, 350. 59	
Total endowment funds and funds functioning as endowment			14, 592, 560. 72
Total			18, 825, 641. 78

EXHIBIT B

PRIVATE FUNDS

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS AND CHANGES IN CURRENT GENERAL FUND BALANCES

Year ended June 30, 1961

	Operations	Publications	Gifts and grants
Current receipts:			
Endowment income:			
Freer Gallery of Art	$561, 579. 06		
Other restricted funds	51, 689. 33		
Unrestricted	132, 765. 04		
Investment income	50, 269. 06		
Gifts and grants	192, 098. 38		$5, 247, 913. 18
Publications and photographs		$90, 006. 23	
Miscellaneous	7, 935. 90	38. 85	
Appropriated from endowment fund	556. 82		
Total current receipts	996, 893. 59	90, 045. 08	5, 247, 913. 18
Current expenditures:			
Salaries:			
Administrative	123, 831. 39		
Research	22, 045. 95		2, 198, 724. 26
Other	174, 221. 63		
Total salaries	320, 098. 97		2, 198, 724. 26
Purchase for collection	293, 305. 14		

Researches and exploration and related administrative expenses:					
Travel		15, 964. 11			
Equipment and supply		4, 041. 69			
Other		7, 483. 22		3, 049, 188. 92	
Publication and photographs		30, 931. 12	56, 842. 33		
Buildings, equipment and grounds:					
Buildings and installations		11, 539. 36			
Court and grounds maintenance		1, 756. 54			
Technical laboratory		1, 731. 99			
Contractual services—custodian and legal fees		24, 246. 17			
Supplies and expenses:					
Meetings, special exhibits		16, 484. 72			
Lectures		3, 408. 07			
Photographs and reproductions		10, 946. 39			
Library		4, 003. 65			
Stationery and office supplies		58. 08			
Postage, telephone and telegraph		235. 41	1. 70		
Employees' withholding payments	$601, 886. 59				
Less employee withholding	554, 126. 98	47, 759. 61			
Total current expenditures		793, 994. 24	56, 844. 03	5, 247, 913. 18	
Excess of current receipts over current expenditures		202, 899. 35	33, 201. 05		$236, 100. 40
Transfer to endowment principal—Ganson Taggart Fund					(500. 00)
Total					235, 600. 40
Balance at beginning of year					623, 034. 11
Balance at end of year					858, 634. 51

EXHIBIT C

PRIVATE FUNDS

STATEMENT OF CHANGES IN CURRENT RESTRICTED FUND BALANCE

Year ended June 30, 1961

	Funds for special purposes		
	Unexpended income	Gifts, grants, etc.	Total
Balance at beginning of year	$1, 127, 115. 28	$1, 331, 791. 41	$2, 458, 906. 69
Add:			
Income from restricted endowment:			
Freer Gallery of Art	436, 006. 08		436, 006. 08
Other restricted funds	258, 908. 76		258, 908. 76
	694, 914. 84		694, 914. 84
Less custodial costs	37, 170. 41		37, 170. 41
Net income from restricted endowment	657, 744. 43		657, 744. 43
Sale of publications	17, 599. 03	1, 674. 38	19, 273. 41
Gifts and grants		6, 127, 382. 33	6, 127, 382. 33
Other	3, 035. 70	169, 394. 08	172, 429. 78
	1, 805, 494. 44	7, 630, 242. 20	9, 435, 736. 64
Deduct:			
Transfer to current income:			
Freer Gallery of Art	525, 806. 14		525, 806. 14
Other restricted funds	50, 291. 84	5, 247, 913. 18	5, 298, 205. 02
Unrestricted	132, 765, 04	42, 068. 49	174, 833. 53
	708, 863. 02	5, 289, 981. 67	5, 998, 844. 69
Income added to principal, net	9, 116. 16		9, 116. 16
Returns to National Science Foundation		51, 729. 57	51, 729. 57
Transfer to (from) gifts and grants	1, 839. 31	(1, 839. 31)	
Transfer to endowment funds	1, 599. 67		1, 599. 67
	721, 418, 16	5, 339, 871. 93	6, 061, 290. 09
Balance at end of year	1, 084, 076. 28	2, 290, 370. 27	3, 374, 446. 55

EXHIBIT D

PRIVATE FUNDS

STATEMENT OF CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS AND FUNDS FUNCTIONING AS ENDOWMENT

Year ending June 30, 1961

Balance at beginning of year		$13,771,652.40
Add:		
Gifts and bequests (including transfer of Ganson Taggart Fund)	$30,849.67	
Income added to principal as prescribed by donor	9,116.16	
Net gain on investments	781,499.31	821,465.14
Total		14,593,117.54
Deduct amounts appropriated to current funds for retirement payments		556.82
		14,592,560.72
Balance at year end consisting of:		
Unrestricted	$2,429,459.09	
Restricted for:		
Freer Gallery of Art	9,721,210.13	
Other collections and research	2,441,891.50	
	14,592,560.72	

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 $12,593.72.

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 Co., contribution to the Rathbun Memorial Fund.

Edward D. Adler, contribution to the Smithsonian Institution.

American Cocoa Research, grant to help defray costs of art work in connection with the publication of a Taxonomic Monograph of the *Genus Theobroma* by Dr. Jose Cuatrecasas.

American Petroleum Institute, grant-in-aid toward the establishment of a permanent exhibit and animated petroleum map in the United States National Museum.

American Petroleum Institute, grant to cover expenses of Dr. G. Arthur Cooper in connection with his participation in the Geology Domain Committee Symposium to be held in Houston, Texas.

609118—61——17

Atomic Energy Commission, additional grant for support of research and study of the biochemical effects of ionizing and nonionizing radiation on plant metabolism during development.

Atomic Energy Commission, additional grant for support of research entitled "Systematic Zoological Research on the Marine Fauna of the Tropical Pacific Area."

Bernice P. Bishop Museum, grant to assist in defraying expenses of Dr. Bernard R. Feinstein in connection with field work in Viet Nam and neighboring countries.

Bredin Foundation, grant for the support of research entitled "Ocean Food Chain Cycle."

Mrs. John S. Burdette, contribution for the restoration of a platform rocker given by her to the Smithsonian Institution.

Alan C. Collins, grant for a research expedition to Tibesti Mountains of Libya.

Curtiss-Wright Corporation, gift for the construction of a replica of the first naval aircraft, the Curtiss A–1.

Department of the Air Force, additional grant for research entitled "Study of Atmospheric Entry and Impact of High Velocity Meteorites."

Department of the Air Force, additional grant for upper atmosphere stellar image study.

Department of the Air Force, additional grant for support of research entitled "The Accretion of Interplanetary Matter by the Earth."

Department of the Air Force, additional grant for research directed toward the study of stellar scintillation.

Department of the Air Force, grant for the support of research entitled "The Reduction of Satellite Observations to Determine Atmospheric Density."

Department of the Army, Ordnance Corps, additional grants for research entitled "Procurement of Satellite Tracking and Orbit."

Department of the Army, Quartermaster Corps, grant for support of a report on "The Biotic Associations of the Blattaria" by Roth and Willis.

Eastern Federation of Mineralogical and Lapidary Societies, grant to defray expenses of Paul E. Desautels while attending the 1960 convention in Asheville, North Carolina.

Felix and Helen Juda Foundation, gift to the Freer Gallery of Art Publication Fund.

Mr. Reuben H. Fleet, gift for the purchase of a scale model of Consolidated NY–1 Aircraft for the National Air Museum.

Alex. Gordon 3d, contribution to the Smithsonian Institution.

Mr. E. P. Henderson, gift for the Meteorite Fund.

Mr. Stewart Huston, gift for the restoration of an 18th Century Chaise.

Institute of Andean Research, grant for Archeological Research in Ecuador on Project J of the Institute of Andean Research Program, "Interrelationships of New World Cultures."

International Association for Plant Taxonomy, gift to cover expenses of Dr. A. C. Smith in connection with travel to Brussels while attending the meeting of the Editorial Committee of the International Code of Botanical Nomenclature.

Jersey Production Research Corporation, additional grant for support of a research project on Echinoid Spines.

Jewitt Foundation, grant for the support of research entitled "Ecology and Morphology of the Hoatzin."

Edwin A. Link, additional gift for the support of the Marine Archeological Project.

Link Foundation, additional gift for the support of special publications dealing with aviation and the Smithsonian Institution Collections.

McDermott Foundation, gift to purchase a telescope which will be loaned indefinitely to the Dallas Moonwatch Team.

Metropolitan Broadcasting Corporation, grant to cover expenses relating to the shipment of the White Tigress from India to the National Zoological Park.

Mitch Miller Foundation, grant for the support of research entitled "Ecology and Morphology of the Hoatzin."

Mrs. George Maurice Morris, gift to establish the Miriam H. Morris Fund.

National Academy of Sciences, travel grants for J. F. Gates Clarke, William Stern, S. H. Reisenberg, and H. G. Diegnan to attend the Tenth Pacific Science congress.

National Aeronautics and Space Administration, additional grants for the support of the Satellite Tracking Program.

National Aeronautics and Space Administration, additional grants for the support of astronomical research studies.

National Aeronautics and Space Administration, additional grant for the acquisition of the "Beyer Tektite Collection."

National Geographic Society, grant for Paleo-Indian investigations at Agate Basin, Eastern Wyoming.

National Institute of Health, grant toward the purchase of the Melander Collection of Diptera.

National Science Foundation:

Grant for research entitled "Obsidian Dating."

Additional grant for research entitled 'Oldest Fossil Bryozoa of the United States."

Additional grant for research entitled "Comparative Analysis of Behavior in Tropical Birds."

Additional grant for research entitled "Morphology and Paleoecology of Permian Brachiopods."

Additional grant for research entitled "Endocrine Basis of Parasitic Breeding in Birds."

Additional grant for research entitled "Metabolic Aspects of the Digestion of Wax."

Additional grant for research entitled "Taxonomic Study of the Phanerogams of Colombia."

Grant for research entitled "Permo-Triassic Reptiles of South Africa."

Grant for partial support for the "Preparation and Publication of *Supplement to Annotated Bibliography of Termites*, 1955–1960."

Grant for research entitled "A Revision of the Beetles of the Genus Neobrotica Jacoby."

Additional grant for research entitled "Systematics of Chilopoda and Diplopoda."

Additional grant for research entitled "Revisionary Study of the Blattoidea."

Additional grant for research entitled "Systematic Studies of South American Microlepidoptera."

Additional grant for research entitled "Early Tertiary Mammals of North America."

Grant for research entitled "Construction of Highly Sensitive Mass Spectrometer for analyzing Rare Gases in Meteorites."

Grant for research entitled "Culture History of South Arabia."

Grant for research entitled "Foreign Cambrian Trilobites with American Affinities."

Grant for research entitled "Systematic Significance of Echinoid Spines."

Grant for research entitled "Botanical Exploration of Southern Brazil."

Grant for research entitled "Research on Stellar Atmosphere."

Grant for research entitled "Extensive Studies, over a long period of time, in the worldwide Order Hemiptera."

Additional grant for research entitled "Taxonomy of the Bamboo."

Grant for research entitled "Settlement pattern in the Missouri Valley."

Grant for research entitled "Caddo Language Study."

Grant for research entitled "A Late Pleistocene Fauna and Possible Human Associations near Littleton, Colorado."

New York Academy of Sciences, gift to defray expenses of Dr. M. T. Newman while attending the conference on "Genetic Perspectives in Disease Resistance and Susceptibility."

Office of Naval Research, additional grant to provide expert consultants to advise the Navy Advisory Committee.

Office of Naval Research, additional grant to perform psychological research studies.

Office of Naval Research, additional grant for support of research entitled "Information on Shark Distribution and the Distribution of Shark Attack all over the World."

Office of Naval Research, additional grant for study concerning the development of a proposal for an institute or laboratory of human performance standards.

Office of Naval Research, additional grant for research in connection with studies on the marine fauna of the South Pacific Ocean.

Office of Naval Research, additional grant to perform aeronautical research studies.

Mrs. John B. Oliver, gift to the Historic Dresses Fund.

Pan American Union, grant for travel expenses of Dr. Clifford Evans and Dr. Betty Meggers to Barranquilla, Colombia, to attend the conference on Methodology.

Mr. B. T. Rocca, gift to the Smithsonian Institution.

Rancho Santa Ana Botanic Garden, grant for joint botanical collecting expedition to the Hawaiian Islands.

St. Petersburg Shell Club, grant to defray expenses of Dr. Harald Rehder to St. Petersburg to attend the annual Shell Show.

Dr. Jeanne S. Schwengel, gift to defray travel expenses of Dr. Harald A. Rehder from Washington to Honolulu in connection with his trip to Jaluit Atoll in the Marshall Islands.

Shell Companies Foundation, gift to purchase 180 volumes of "Collection of Pilots and Engine Handbooks."

Texas Gulf Sulphur Co., grant for the construction of two Frasch Models.

U.S. Department of Agriculture, grant for the support of research in the Order Diptera.

Wenner-Gren Foundation, grant to defray travel expenses of Dr. T. Dale Stewart while attending the Wenner-Gren Foundation Symposium Number 16.

Woods Hole Oceanographic Institution, grant to cover travel expenses of Dr. Richard Cifelli to participate in Woods Hole Oceanographic Institution research cruises in the North Atlantic.

Yale University, gift to defray travel expenses of Dr. William L. Stern in connection with a trip to New Haven, Connecticut.

For support of the Science Information Exchange:
Atomic Energy Commission
Department of Defense
Department of the Navy
Federal Aviation Agency
National Aeronautics and Space Administration
National Institute of Health
National Science Foundation
Veterans' Administration

Included in the above list of gifts and contributions are reimbursable contracts.

The foregoing report relates only to the private funds of the Institution.

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1961:

Salaries and Expenses	$8,114,000.00
National Zoological Park	1,304,000.00

The appropriation made to the National Gallery of Art (which is a bureau of the Smithsonian Institution) was $1,920,000.00.

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	$123,895.00

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 25, D.C.

We have examined the balance sheet of private funds of Smithsonian Institution as of June 30, 1961 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 and other departments, bureaus and operations admin-

istered 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, 1961; 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.
September 11, 1961

Respectfully submitted.

(s) CLARENCE CANNON,
(s) CARYL P. HASKINS,
(s) ROBERT V. FLEMING,
Executive Committee.

○