Smithsonian Institution

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

1962

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

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For the year ended June 30

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THE SMITHSONIAN INSTITUTION

June 30, 1962

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.
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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.
CLARENCE CANNON, Member of the House of Representatives.
MICHAEL J. KIRWAN, Member of the House of Representatives.
JOHN NICHOLAS BROWN, citizen of Rhode Island.
ROBERT V. FLEMING, citizen of Washington, D.C.
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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 LINDSAY.
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, W. H. Crocker, 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: H. H. Hobbs, Jr., head curator.

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

Division of Birds: P. S. Humphrey, 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., D. R. Davis, associate curators.

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

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

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

Division of Phanerogams: L. B. Smith, curator: R. S. Cowan, 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, associate curator.

Division of Cryptogams: M. E. Hale, Jr., curator; P. S. Conger, associate 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, curator; 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, B. W. Lawless, Jr., Julius Tretick.

DEPARTMENT OF SCIENCE AND TECHNOLOGY: R. P. Multhauf, head curator: Joseph E. Rudmann, assistant curator.

Division of Physical Sciences: L. C. Lewis, curator; W. F. Cannon, associate curator.

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

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

Division of Electricity: R. P. Multhauf, acting curator.

Division of Medical Sciences: S. K. Hamarneh, associate curator in charge.

DEPARTMENT OF ARTS AND MANUFACTURES: P. W. Bishop, head curator.

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

Division of Ceramics and Glass: P. V. Gardner, curator.

Division of Graphic Arts: Jacob Kainen, curator; F. O. Griffith, Eugene Ostroff, 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: Richard H. Howland, head curator; P. C. Welsh, associate curator; Doris A. Esch, assistant curator; Ellen J. Finnegan, junior curator.

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

Division of Cultural History: C. Malcolm Watkins, curator; Rodris C. Roth, associate curator; Anthony W. Hathaway, J. N. Pearce, Cynthia L. Adams, assistant curators.

Division of Philately and Postal History: Richard H. Howland, acting curator; G. T. Turner, F. J. McCall, associate curators; C. H. Scheele, assistant curator.

Division of Numismatics: Vladimir Clain-Stefanelli, curator; 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, curator; M. H. Jackson, associate curator.

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. Colombo, L. Goldberg, S. Hamid, I. G. Izsak, Y. Kozai, J. Slowey, F. W. Wright, P. E. Zadunaisky.

Mathematicians.—R. E. Briggs, D. A. Lautman.
Physicists.—E. Avrett, A. F. Cook, R. J. Davis, J. DeFelice, E. L. Fireman, F. Franklin, O. Gingerich, M. Grossi, P. W. Hodge, L. G. Jacchia, W. Kalkofen, M. Krook, R. E. McCrosky, H. Mitler, T. W. Noonan, R. B. Riggs, Jr., O. P. Rustgi, A. Skalafuris, R. B. Southworth, D. Tilles, C. A. Whitney.
Geodesists.—J. Rolff, G. Veis.
Geologists.—V. B. Marvin, J. Wood.

DIVISION OF RADIATION AND ORGANISMS:
Chief.—W. H. Klein.
Plant physiologists.—P. J. A. L. deLint, J. L. Edwards, V. B. Elstad, K. Mitrakos, L. Price.
Biophysicist.—W. Shropshire.
Biochemist.—M. Margulies.
Cytogeneticist.—R. L. Latterell.
Electronic Engineer.—J. H. Harrison.
Instrument engineering technician.—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.—JOHN A. POPE.
Acting Assistant Director.—Harold P. Stern.
Head curator, Near Eastern Art.—Richard Ettinghausen.
Associate curator, Chinese Art.—James F. Cahill.
Head curator, Laboratory.—Rutherford J. Gettens.

NATIONAL AIR MUSEUM

Advisory Board:
Leonard Carmichael, *Chairman.*
Maj. Gen. Brooke E. Allen, U.S. Air Force.
Rear Adm. P. D. Stroop, U.S. Navy.
Lt. Gen. James H. Doolittle (U.S.A.F. Ret.)
Grover Loening.
Director.—P. S. Hopkins.
Head curator and historian.—P. E. Garber.
Curators.—L. S. Casey, K. E. Newland.
Curator.—R. B. Meyer.

NATIONAL ZOOLOGICAL PARK

Director.—T. H. Reed.
Associate Director.—J. L. Grimmer.
General Curator.—Waldfried T. Roth.
Zoologist.—Marion McCrane.
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.
CHESTER DALE.
PAUL MELLON.
RUSH H. KRESS.
JOHN HAY WHITNEY.
JOHN N. IRWIN II.

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.
G. H. Cole, Archeology.
Albert Jamme, 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

Mrs. Doris H. Blake, Insects.
J. Bruce Bredin, Biology.
M. A. Carriker, Insects.
Ailsa M. Clark, Marine Invertebrates.
H. G. Deignan, Birds.
C. J. Drake, Insects.
Herbert Friedmann, Birds.
F. M. Hull, Insects.
Laurence Irving, Birds.
W. L. Jellison, Insects.
Allen McIntosh, Mollusks.
J. P. Moore, Marine Invertebrates.
C. F. W. Muesebeck, Insects.
W. L. Schmitt, Marine Invertebrates.
Benjamin Schwartz, Helminthology.
R. E. Snodgrass, Insects.
T. E. Snyder, Insects.
Alexander Wetmore, Birds.
Mrs. Mildred S. Wilson, Copepod Crustacea.

Botany

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

Geology

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

MUSEUM OF HISTORY AND TECHNOLOGY

History

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

Science and Technology

D. J. Price.

Exhibits

W. L. Brown, Taxidermy.

Bureau of American Ethnology

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.
Alfred V. Verville

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, 1962

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, 1962.

GENERAL STATEMENT

The writer of any annual report can well be accused of a want of originality if each year he begins by saying, "The twelve months covered by this report have been characterized by progress and constructive activity." Lacking in novelty as it is, this statement, however, must be made with strong emphasis about the Smithsonian Institution for the period between July 1, 1961, and June 30, 1962, for this year has indeed seen outstanding advances in many areas of the Institution's work.

There is one aspect of this year's accomplishment that is of primary importance but that cannot easily be reduced to statistics or presented on a graph. This pertains to the strengthening of the staff. During the months covered by this Report, there have been a number of retirements for age and for other reasons from the professional staff of the Institution. A number of these losses were of very distinguished scholars who can never be exactly replaced; but, on the other hand, a number of outstanding new scientists and academic specialists have come to the Institution, some of them already widely known because of their previous scholarly contributions. For many years the professional or, as it may be termed, the academic staff of the Institution has enjoyed world-wide respect because of the individual distinction of many of its members. The year's new appointments will, I am confident, strengthen this great Smithsonian tradition. It is surely important that Smithsonian experts be leaders in their varied fields if the Institution is to perform in the best possible way the specialized and in some ways unique functions assigned to it by its founder and by the Congress.

James Smithson, in leaving what was for his time a large estate to the United States, directed in his will, written almost a century and a half ago, that the institution that was always to bear his name should be devoted to "the increase and diffusion of knowledge among men." The basic legislation that created the Smithsonian was passed by the Congress and signed by President James K. Polk 116 years ago. One of the most important provisions of the act is the direction that the Institution should be faithful in the execution of the trust of James Smithson "according to the will of the liberal and enlightened donor."

The first Smithsonian Board of Regents wisely chose Joseph Henry, then possibly the greatest student of experimental science in America, as the first Secretary of the Institution. The group of men who were assembled and who worked in the then new Smithsonian Building constituted the first research organization with a full-time staff of investigators in a wide variety of scientific fields ever assembled on this continent. Particularly during the Institution's first half century, under the effective administration of Henry and of his successor, Spencer F. Baird, a staff of broad-gauge, distinguished scientists was built up. Such names come to mind as George Brown Goode, John Wesley Powell, William Healey Dall, Robert Ridgway, Frank Hamilton Cushing, W J McGee, William Henry Holmes, and Leonard Stejneger—principally naturalists, ethnologists, and explorers who brought distinction to the Smithsonian through the notable contributions to science that they made each in his field.

Since Henry's and Baird's time there has been no deviation from the policy of naming to the staff individuals who have won a recognized place as leaders in the various fields of science and scholarship that are dealt with at the Institution. The high title of "curator" at the Smithsonian thus becomes the equivalent of a research professorship in any great university.

Last year the Smithsonian published 85 titles, making available to the world the results of Smithsonian research. This brings the total number of scholarly publications of the Smithsonian to at least 10,000 since its first scientific monograph appeared in 1848. Besides these formal publications the staff of the Institution also answered over 325,000 specific requests for information during the period covered by this report.

One who knows the staff of the Institution in detail can go through the names of those who work in its bureaus and laboratories with a feeling of deep pride at the distinction of the men and women who are spending their professional lives at the Smithsonian.

In the Museum of Natural History, which is part of the United States National Museum of the Smithsonian Institution, there are

many very highly regarded scientists. For example, in the field of anthropology the Institution has distinguished archeologists, ethnologists, and students of cultural and physical anthropology. In the area of zoology there are experts on mammals, birds, reptiles, amphibians, fishes, insects, marine invertebrates, mollusks, and other fauna. In all the principal branches of botany the Institution has experts who work with the millions of specimens of plants in the United States National Herbarium of the Smithsonian Institution. The same may be said of the Smithsonian's department of geology, where scholars with expert knowledge in such fields as mineralogy, invertebrate and vertebrate paleontology, and paleobotany are at work.

The Museum of History and Technology, which also is a part of the United States National Museum, has on its staff experts in the history of the physical sciences, mechanical, electrical, civil, and other fields of engineering, and the history of transportation and of the medical sciences. Under the general heading of arts and manufactures, the Institution has experts in textiles, ceramics, glass, agricultural implements, and the processes and equipment of the so-called heavy industries. In the department of civil history the Institution has scholars who are specialists in political history, cultural history, as well as in philately and numismatics. The research staff of the Division of Military and Naval History deals in an expert way with the facts and especially of museum objects that are related to the development of the Armed Forces of the Nation.

The Bureau of American Ethnology and the Astrophysical Observatory of the Smithsonian both have staffs of distinguished scientists. In the field of art, the National Gallery of Art, the National Collection of Fine Arts, and the Freer Gallery of Art all are represented by scholarly staffs. The same may be said of the staff of the National Air Museum, the National Zoological Park, and the Canal Zone Biological Area.

This outline enumeration of these fields of expert knowledge represented at the Smithsonian demonstrates how important it is for the Institution at all times to devote its best energies to the securing of individuals for its staff who have outstanding qualifications. Today, because of increasing competition with large governmental organizations and research oriented universities, obtaining men and women of high distinction for what may be called the research faculty of the Smithsonian is not easy. The current year has, however, been one in which some truly outstanding scholars have elected to join the family of experts who make up the modern Smithsonian.

In last year's report a summary was given of the progress that had taken place in recent years in the renovation of exhibits at the Smithsonian. Work on this great program continued in an active way dur-

ing the present year. Once again it may be pointed out that as a result of the new educationally significant exhibits now on view the total attendance at the Smithsonian again reached an all-time record. In the old Smithsonian Institution buildings on the Mall, exclusive of the National Gallery of Art and the National Zoological Park, attendance this year reached 8,923,131. This is an increase of 1,819,657 visitors over the previous year. This year's attendance becomes even more dramatic when it is remembered that only 10 years ago the total attendance at these same buildings was 3,103,651.

It is important for all who are interested in the work of the Smithsonian to remember that in spite of its outstanding new exhibits the total collections of the Smithsonian contain many more objects than are on exhibition. These great study collections are utilized by hundreds of research workers from other government bureaus and from universities all over the United States each year. The total number of cataloged objects at the Smithsonian Institution now numbers nearly 56 million.

When the east and west wings of the Natural History Building are completed and opened for use and when the great new Museum of History and Technology is open, the effectiveness of the whole pattern of public display and of the use of study collections will be greatly increased.

To all who are interested in the active present programs of the Institution, it is important to point out that the high caliber of its staff, the new Smithsonian buildings, the improvements in the display of objects, and the increase of collections are all directly and indirectly related to the leadership of the Institution provided by its distinguished Board of Regents. The Secretary and all the staff members of the Institution can never express in an adequate way their deep debt of gratitude to the members of the Board of Regents for all that they do each year for the welfare of the Smithsonian Institution.

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 Institution suffered a deep loss during the year in the deaths of two of its Regents: Representative Overton Brooks on September 16, 1961; and Dr. Arthur H. Compton on March 15, 1962. Mr. Brooks had served as a Regent for over 6½ years, and Dr. Compton's length of service as a Regent (over 23 years) is exceeded by only one member of the present Board. The wisdom and counsel of these eminent and distinguished members will be greatly missed. Representative Michael J. Kirwan of Ohio was appointed by the Speaker of the House of Representatives to fill the vacancy in the congressional membership. The appointment to the vacancy in the class of Citizen Regents was pending at the end of the fiscal year covered by this report.

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

An informal dinner meeting, preceding the annual meeting, was held on the evening of January 24, 1962, in the main hall of the Smithsonian Building. Exhibits were arranged at this time from the various divisions showing some of the most recent developments in the work of the Smithsonian bureaus. Dr. Nicholas Hotton III spoke on "Mammal-like Reptiles of South Africa"; Dr. Philip K. Lundeberg on "The Revolutionary War Gunboat *Philadelphia*"; Dr. Harold P. Stern on "Research and Contrast—Japanese Art in European Collections"; and Dr. Fred L. Whipple on "Dust in Space."

The annual meeting was held on January 25, 1962. The Secretary presented his published annual report on the activities of the Institution. The financial report for the fiscal year ended June 30, 1961, was presented.

In addition to the annual meeting, the Board of Regents met again on May 18, 1962. A brief report was presented on the new Museum of History and Technology Building, and the chairman of the executive and permanent committees of the Board presented a financial report. The Regents then adjourned to inspect the Air and Space Building.

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 227. Funds appropriated to the Insti-

tution for its regular operations for the fiscal year ended June 30, 1962, totaled $9,125,000. 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, $1,387,600; from the National Park Service, Department of the Interior, for the River Basin Surveys, $231,705.

VISITORS

Visitors to the Smithsonian group of buildings on the Mall reached a total of 8,923,131, an all-time high and 1,819,657 more than for the previous year. April 1962, with 1,490,262, was the month of largest attendance; August 1961 second, with 1,335,189; May 1962 third, with 1,160,980. Table 1 gives a summary of the attendance records for the five buildings; table 2, groups of school children. The figures are all actual counts and are not estimates. No fully satisfactory plan for an actual count of visitors to the National Zoological Park has been developed. Under the new plan of estimating, the number of visitors during the year covered by this report indicates an attendance at the Zoo of 2,035,000. When this figure is added to the figure for attendance in the Institution's buildings on the Mall, and to the 1,332,506 recorded at the National Gallery of Art, the total Smithsonian attendance for 1962 may be set at 12,290,637.

TABLE 1.—*Visitors to certain Smithsonian buildings during the year ended June 30, 1962*

Year and month	Smithsonian Building	Arts and Industries Building	Natural History Building	Air and Space Building	Freer Building	Total
1961						
July	158, 793	540, 436	255, 738	161, 542	13, 803	1, 130, 312
August	161, 689	647, 184	304, 306	208, 486	13, 524	1, 335, 189
September	49, 403	186, 702	109, 433	58, 295	6, 008	409, 841
October	51, 248	174, 515	127, 271	70, 705	7, 456	431, 195
November	56, 467	157, 901	135, 748	87, 687	7, 589	445, 392
December	30, 480	77, 897	75, 354	51, 919	5, 625	241, 275
1962						
January	28, 268	73, 554	77, 397	48, 434	5, 430	233, 083
February	44, 842	109, 370	105, 047	84, 112	6, 289	349, 660
March	70, 750	164, 641	142, 139	163, 651	11, 220	552, 401
April	210, 408	521, 962	302, 351	433, 612	21, 929	1, 490, 262
May	165, 161	424, 154	252, 709	304, 785	14, 171	1, 160, 980
June	194, 603	392, 734	225, 560	313, 091	17, 553	1, 143, 541
Total	1, 222, 112	3, 471, 050	2, 113, 053	1, 986, 319	130, 597	8, 923, 131

TABLE 2.—*Groups of school children visiting the Smithsonian Institution during the year ended June 30, 1962*

Year and month	Number of children	Number of groups	Year and month	Number of children	Number of groups
1961			*1962*		
July	7, 441	239	January	9, 186	296
August	4, 506	175	February	15, 010	445
September	2, 521	77	March	39, 490	972
October	15, 906	384	April	89, 516	1, 735
November	27, 689	762	May	172, 665	3, 508
December	10, 335	288	June	66, 587	1, 579
			Total	460, 852	10, 460

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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, 1962:

COLLECTIONS

During the year 854,135 specimens were added to the national collections and distributed among the eight departments as follows: Anthropology, 13,556; zoology, 480,003; botany, 32,236; geology, 115,387; science and technology, 2,363; arts and manufactures, 3,155; civil history, 205,358; and armed forces history, 2,077. The largest divisional acquisition was in the division of insects, which accessioned a total of 417,279 specimens. Most of this year's accessions were acquired as gifts from individuals or as transfers from Government departments and agencies. The complete report on the Museum, published as a separate document, includes a detailed list of the year's acquisitions, of which the more important are summarized below. Catalog entries in all departments now total 55,817,940.

Anthropology.—The division of archeology received by transfer from the River Basin Surveys 11,334 artifacts, mainly of mid-19th-century white man's manufacture, from the site of Fort Berthold, N. Dak. The following important additions to the divisional Latin American collections were also received: 24 pre-Spanish textiles from Peru, presented by the International Business Machines Corp.; a representative group of 42 stone and bone artifacts from the early cultures of the Lagoa Santa area in Minas Gerais, Brazil, presented by H. V. Walter, of Belo Horizonte; and a type collection of 290 pottery and stone artifacts from various cultural levels on the islands at the mouth of the Amazon River, collected and donated by Drs. Clifford Evans and Betty Meggers.

As a gift from the Government of India, the division of ethnology received 292 ethnological objects, including a complete assemblage of dance costumes of the Kathakali religious drama of South India, textiles of unusual quality, and representing a wide range of techniques and designs. Another fine ethnological collection, comprising native musical instruments and a large number of shadow-theater puppets, was donated by the Federation of Malaya through its National Mu-

seum in Kuala Lumpur. Obtained from Rev. Francis Lambrecht, of Baguio, Philippine Islands, and from Dr. Harold C. Conklin, of Columbia University, are 51 cultural objects of the Ifugao, one of the mountain peoples of the Philippines. Approximately 854 ethnological specimens from India, Pakistan, Northern Rhodesia, the eastern Congo, the Cook Islands, and the Solomon Islands were procured from various sources under the exhibits modernization program.

The division of physical anthropology received for the first time a good collection of prehistoric skeletal remains. The collection, assembled by Dr. Samuel K. Lothrop and donated by the Peabody Museum, Harvard University, comes from the Venado Beach site located at the Pacific end of the Panama Canal Zone. An important feature of this collection is the presence of a type of cranial deformity heretofore known mainly from Mexico. A donation of 15 prehistoric Indian skeletons from the W. R. Winslow site on the Potomac River in Montgomery County, Md., was received from the Southwestern Chapter of the Archeological Society of Maryland. Dr. Dan Morse of Peoria, Ill., added two specimens from that State to the division's outstanding collection of skeletal evidence bearing on the history of tuberculosis among the earlier American Indians.

Zoology.—Most of the accessions received in the division of mammals represent established programs of collecting and research in various parts of the world. Approximately 450 specimens were obtained by Bernard R. Feinstein from Viet Nam and Cambodia, in cooperation with the Army Medical Research and Development Command and the Bernice P. Bishop Museum. The Smithsonian Institution-Alan Collins Expedition of 1961 contributed 163 mammals from previously unworked areas in Libya and Chad, collected by Dr. Henry W. Setzer. From Panama and the Canal Zone, about 750 mammals were sent to the Museum by Vernon J. Tipton, C. M. Keenan, Carl M. Johnson, Pedro Galindo, Conrad E. Yunker, and other contributors representing agencies cooperating in the major project being conducted by Dr. C. O. Handley, Jr. Several accessions from localities in the eastern United States include specimens collected by Kyle R. Barbehenn in Maryland and New York; by John T. Banks in Virginia; by C. O. Handley, Jr., in Virginia, Georgia, and Florida; by Richard and Daniel Peacock in North Carolina and Virginia; by Daniel I. Rhymer in Virginia; and by Merlin D. Tuttle in Tennessee. Specimens of outstanding interest are 102 bats from Drotzky's Cave and vicinity, Bechuanaland Protectorate, presented by Laurence K. Marshall, and five rare dolphins, *Stenella microps*, from the west coast of Mexico, received from Dr. R. R. Whitney, of the U.S. Fish and Wildlife Service, and Dr. W. L. Klawe, of the Inter-American Tropical Tuna Commission.

Among the 1,454 specimens received in the division of birds is a series of 583 bird skins, 27 skeletons, 3 alcoholic specimens, and 14 eggs contributed by Dr. Alexander Wetmore, retired Secretary of the Smithsonian Institution. From the Republic of Panama Gorgas Memorial Laboratory, 100 bird skins were received, and by transfer from the U.S. Fish and Wildlife Service 419 bird skins, 47 skeletons, 1 alcoholic specimen, and 10 eggs were added to the national collections.

In the division of reptiles and amphibians, several accessions are noteworthy. Procured from Dr. Fred Medem, Instituto de Ciencias Naturales, Bogotá, Colombia, were 226 Colombian frogs. A gift from Dr. Coleman J. Goin, of the University of Florida, of 116 Colombian frogs, an exchange involving the receipt of 9 South American frogs, including a cotype of a Colombian arrow-poison frog, from the British Museum of Natural History, and a gift of 105 South American frogs from Dr. James R. Tamsitt, University of the Andes, Bogotá, Colombia, constitute outstanding additions to the Museum's South American holdings. By transfer from the U.S. Naval Medical Research Unit No. 2, 41 snakes from Taiwan add to the already excellent collection from that island.

The majority of the specimens received in the division of fishes was contributed by the U.S. Fish and Wildlife Service. This cooperation of another Government agency in building up the Smithsonian research collections should be credited to the following individuals: Elbert H. Ahlstrom, W. W. Anderson, Harvey R. Bullis, John R. Clark, Daniel M. Cohen, Eugene Cypert, George F. Kelly, Craig Phillips, James G. Ragan, Donald W. Strasburg, and Paul J. Struhsaker. Dr. Edward C. Raney and Dr. Bruce B. Collette gave 2,500 fishes collected by the latter in Cuba, and Dr. Robert E. Kuntz and Lt. W. H. Wells transferred 1,412 fishes collected at Taiwan by the U.S. Naval Medical Research Unit No. 2.

The largest and perhaps most important accession received in the division of insects is the A. L. Melander collection of Diptera, consisting of approximately 250,000 specimens, including 1,200 types. Through Dr. Alfred Brauer, the W. D. Funkhouser collection of Membracidae (Hemiptera) consisting of 23,855 specimens was received from the University of Kentucky. The Connecticut Agricultural Experiment Station donated, through Dr. James B. Kring, 346 type specimens, including 130 holotypes. Most of these types are Hymenoptera not previously represented in the national collections. Dr. A. Earl Pritchard presented his collection of 12,142 Diptera. N. L. H. Krauss again made a substantial gift in donating 11,572 specimens principally from the Neotropical Region. Col. Robert Traub presented more than 10,000 mites from Malaya and Thailand.

The Graham Heid collection of 2,243 specimens, chiefly Lycaenidae, from Atlanta, Ga., was also obtained. The Boyce Thompson Institute for Plant Research presented 7,966 miscellaneous insects through Dr. Albert Hartzell; O. L. Cartwright donated 7,500 Scarabaeidae from his personal collection; and Dr. C. M. Biezanko added 621 Brazilian insects. Dr. Nell B. Causey, University of Arkansas, donated 415 centipedes, most of which were collected in the southern United States. Received by transfer from the Insect Identification and Parasite Introduction Research Branch, U.S. Department of Agriculture, were 59,673 specimens retained in the course of identifications made by the combined staffs.

Outstanding among the accessions acquired by the division of marine invertebrates were 1,461 identified copepod crustaceans, including 2 holotypes, 2 allotypes, and 672 paratypes of 14 species, donated by Dr. Arthur G. Humes, of Boston University. Received from Mrs. Will Hutchins, Washington, D.C., were 2,000 slides of bryozoans representing the personal collection of her son, the late Dr. Louis W. Hutchins. Dr. Paul L. Illg, University of Washington, added 22 specimens of 10 species of notodelphyid copepod crustaceans, including holotypes of all 10 species, allotypes of 2, and paratypes of 6. From C. E. Dawson, Gulf Coast Research Laboratory, 620 miscellaneous marine invertebrates collected in the Persian Gulf were received. Dr. Arthur Loveridge, St. Helena Island, added 334 miscellaneous marine invertebrates. A gift of 208 amphipod crustaceans collected during a voyage in the Okhotsk Sea of the training ship *Hokusei Maru* was made by Dr. Sigeru Motoda, Hokkaido University. Received from the Carnegie Institution of Washington were 1,800 lots of plankton from the cruises of the *Carnegie*. Received by transfer from the U.S. Navy Hydrographic Office, through William H. Littlewood, were 360 miscellaneous marine invertebrates collected in the Ross Sea by J. Q. Tierney, from the U.S.S. *Staten Island* during the U.S. Navy Deep Freeze Expedition of 1960–61. Collections made for the Smithsonian include 1,165 miscellaneous marine invertebrates from Puerto Rico by Dr. Thomas E. Bowman and 1,512 crayfishes from Alabama, Georgia, North Carolina, Kentucky, and Tennessee by Dr. Horton H. Hobbs, Jr.

A total of 127 accessions, comprising 1,923 lots and 20,621 specimens, was received by the division of mollusks. In addition, 1,597 lots, totaling 14,980 specimens, from previously recorded accessions were added. A number of important collections of marine mollusks from areas in the Indo-Pacific region poorly represented in the study collection were received from various sources. Purchased through the Chamberlain fund was a marine collection of 702 lots containing 2,165 specimens from the Kudat area, North Borneo. Two collections

of marine mollusks from the Seychelles, totaling 195 lots, 1,041 specimens, were received as gifts from Mrs. Margot B. Banks and Barry Grogan. By exchange from the Academy of Natural Sciences of Philadelphia, 92 lots, 920 specimens, of marine mollusks from Madagascar were received. The holotypes of six species of nudibranchs were donated by the Marine Laboratory of the University of Miami through Dr. Gilbert L. Voss.

Botany.—The Gray Herbarium of Harvard University sent in exchange 873 plant specimens, largely from North America. The Herbarium Bogoriense, Bogor, Indonesia, forwarded in exchange 2,417 specimens of Indonesia. Also received in exchange were 950 plants of New Guinea and Australia from the Commonwealth Scientific and Industrial Research Organization, Canberra, Australia; 515 specimens collected in Alaska by J. E. Cantlon from Michigan State University; 300 specimens from Africa from the Istituto Botanico, Firenze, Italy; and 840 plants collected by R. M. King in Mexico from the University of Texas.

The division of woods received the Archie F. Wilson collection, comprising 4,637 wood specimens and constituting a more critically chosen group of specimens from a greater number of species than existed in the division prior to 1960. Mr. Wilson, a business executive with a keen interest in woody plants, was a research associate of the Chicago Natural History Museum for many years. In exchange 727 wood specimens from Netherlands New Guinea were received from the Division of Forest Products of the Australian Commonwealth Scientific and Industrial Research Organization. Important pollen slides received were 309 from Duke University and 642 from the Pan American Petroleum Corp., Tulsa, Okla. Dr. William L. Stern made a collection of 136 wood samples of the highly peculiar flora of the Hawaiian Islands.

Field collecting by staff members yielded the following for the department: 1,091 specimens, mostly grasses, collected in Mexico, by Dr. T. R. Soderstrom, and 1,423 specimens, collected in Oregon, Colorado, Hawaii, and the Florida Keys, by Dr. W. L. Stern. From the U.S. Geological Survey were transferred 593 specimens collected by Dr. F. R. Fosberg on the Pacific Islands, and 766 specimens from Alaska collected by H. T. Shacklette; from the Agricultural Research Service, U.S. Department of Agriculture, 325 specimens of South Africa collected by H. S. Gentry and A. S. Barclay; and from the U.S. Forest Service, 415 specimens from Puerto Rico, collected by E. L. Little.

Geology.—A total of 3,252 specimens was received in the division of mineralogy and petrology. An important gift is a very fine gem-quality crystal of emerald weighing 176.66 carats, from Muzo, Co-

lombia, from Fred C. Kennedy. New mineral species received as gifts were: chambersite, Texas, from Frank R. Beck; orthopinakiolite, Sweden, from the Naturhistoriska Riksmuseets, Stockholm, Sweden; and ferriphengite, Japan, from the University of Tokyo. Outstanding among specimens received in exchange is an extraordinary crystal of kunzite (the lavender gem variety of spodumene) weighing 5 kilograms. New species received in exchange were: birnessite, Massachusetts; rooseveltite, sigloite, and farallonite, Bolivia; kahlerite, Austria; yoshimuraite, Japan; cheralite, Malaya; sharpite and wyartite, Congo; and fleischerite, South West Africa.

Outstanding specimens added by purchase from the Roebling fund or by exchange are two groups of very large stibnite crystals completely altered to stibiconite, Mexico; four fine amethyst geodes, Brazil; a large single crystal of amethyst, Korea; two groups of unusually large axinite crystals, Japan; and a collection of 40 very fine wulfenite specimens from various localities in Arizona. Acquired by purchase from the Canfield fund is a very large single crystal of danburite, Mexico, and a large tourmaline crystal from Baja California.

New acquisitions to the gem collection are the following: a 423-carat sapphire, one of the largest and finest in the world, from Mrs. John Logan (the former Mrs. Rebecca Guggenheim); a large wine pourer carved in white jade, formerly a part of the Vetlesen jade collection, donated by Mrs. Mildred Taber Keally; and a female head sculptured in pink tourmaline by Oskar J. W. Hansen, given by Ray A. Graham. Gem specimens acquired by purchase from the Chamberlain fund for the Isaac Lea collection include a 45.9-carat sphalerite, Spain; a kornerupine weighing 21.58 carats, Ceylon; smoky quartz, Brazil, weighing 1,695.5 carats; a 71.05-carat brownish yellow spodumene, Madagascar; two scheelites, one weighing 37 carats from California, and the other 7.35 carats from Mexico; and a fine kunzite from Brazil weighing 63.30 carats.

A number of outstanding gems were received in exchange, including a very fine 287-carat peridot, an extraordinary 330-carat blue star sapphire, and a fine ruby spinel weighing 36.10 carats, all from Burma; and an excellent 187-carat aquamarine from Brazil.

During the year 25 different meteorites were added to the meteorite collection, including 15 new to the collection. Obtained as gifts were the following: four specimens of the Murray, Ky., meteorite having a total weight of 163 grams, donated by Dyer Observatory, Vanderbilt University; a complete stone which fell in her yard was given by Mrs. Jay Law, Garland, Utah; and a piece of a new Carbonaceous chondrite from Belle, Tex., donated by Oscar Monnig, Fort Worth, Tex.

Fourteen meteorites were obtained by exchange with the following institutions: Geological Survey of India; Committee on Meteorites, Academy of Sciences, U.S.S.R.; Universitets Mineralogiske Museum, Copenhagen, Denmark; Geological Survey of South Africa; and Victoria University, Wellington, New Zealand. Two recent falls, Ras Tamur, Saudi Arabia, and Ehole, Angola, were obtained by transfer from the Smithsonian Astrophysical Observatory.

Several large and important collections of fossil plants and invertebrates were acquired this year by the division of invertebrate paleontology and paleobotany. Funds from the income of the Walcott bequest were used to purchase the incomparable Bones collection of Eocene seeds, nuts, fruits, and wood from Oregon, consisting of over 5,000 specimens of remarkable preservation collected and prepared by Thomas J. Bones, of Vancouver, Wash., over a period of 20 years. The Walcott bequest also made possible field work which yielded 10,000 Cretaceous mollusks and 500 Foraminifera samples, collected by associate curator Erle G. Kauffman and Dr. Norman F. Sohl; and 10,000 specimens of Ordovician and Silurian invertebrates from those respective formations of Great Britain, Norway, and Sweden collected by curator Richard S. Boardman.

Donations from collectors outside of the Museum accounted for the following gifts: 1,500 Lower Paleozoic fossils from areas including Nova Scotia, Maine, Germany, and Gotland from Dr. Arthur J. Boucot, of the California Institute of Technology; 345 type specimens of Foraminifera from California and the Mississippi Delta regions from Miss Frances L. Parker, of Scripps Institution of Oceanography; 175 type specimens of planktonic Foraminifera from the Caribbean region from Dr. Pedro J. Bermudez, of Venezuela; 87 ostracod types from the early Middle Ordovician of eastern United States and 146 types from the Gubic formation of northern Alaska from Dr. F. M. Swain, Jr., University of Minnesota; 300 specimens from the Ripley formation received from the Mid-South Earth Science Club of Tennessee; 350 specimens from the Devonian of the Spanish Sahara from the Pan American Hispano Oil Co.; and 332 Mesozoic specimens from Saudi Arabia donated by the American Arabian Oil Co.

Transfer of collections from the U.S. Geological Survey includes the Hass collection of conodonts, numbering an estimated 40,000 specimens and several hundred types; 168 Middle and Upper Devonian cephalopods collected by Dr. Mackenzie Gordon in Morocco; an estimated 35,600 Bryozoa from the Lower Paleozoic of New York, West Virginia, Virginia, and Tennessee, collected by Dr. Boardman.

A collection of 189 specimens of fossil mammal-like reptiles from the Karroo, Republic of South Africa, was accessioned in the division of vertebrate paleontology. These specimens are representative of

all levels of the Beaufort series (Permo-Triassic) and document the therapsid adaptive radiation of that time and also the strong trend toward mammalian organization for which these animals are noted. The therapsids illustrate an important phase in vertebrate evolution, which has heretofore been unrepresented in the national collections. The fossils are of high quality, consisting of about 40 complete or partial skeletons with the remainder being skulls. The collection was made by associate curator Nicholas Hotton III and by James W. Kitching, of the Bernard Price Institute for Paleontological Research, University of the Witwatersrand, Johannesburg. Noteworthy of mention also are the skulls of about 200 individuals of the Permian amphibian *Diplocaulus* collected by Dr. Sergius H. Mamay, of the U.S. Geological Survey, and Dr. Walter W. Dalquest, of Midwestern University, in terrestrial deposits of the Vale formation in Texas. Another outstanding addition to the collections is a 4-ton shipment of skeletal remains, almost all of the mammoth *Mammuthus columbi*, from a spring deposit on the ranch of Charles I. Lamb near Littleton, Colo. These were collected by a joint archeological-paleontological party under the supervision of Dr. Waldo R. Wedel and Dr. C. L. Gazin. Particular mention may be made of stratigraphically important accessions of Eocene and Paleocene mammals from new localities in the Fossil, Wind River, and Green River basins of Wyoming, and of early Oligocene mammal jaws and teeth from Pipestone Springs in Jefferson County, Mont., collected by curator C. L. Gazin and Franklin L. Pearce.

Science and technology.—Examples of the rotating mirrors used by A. A. Michelson in his experiments in the determination of the velocity of light were obtained in the division of physical sciences from Preston Bassett and from Mount Wilson and Palomar Observatories. Dr. Henry E. Paul donated telescopes representing the work of Alvan Clark and Sons and John Brashear. Two of the earliest extant examples of photographs of the sun and moon, made by the pioneer scientist and photographer John W. Draper, were obtained from New York University. A group of 12 globes painted to illustrate as many geophysical phenomena, from Prof. Rhodes W. Fairbridge, of Columbia University, was added to the geophysical collections. Gulf Research & Development Co. contributed the pendulum apparatus for relative gravity determination which was developed by them in 1929. John Kusner contributed a repeating circle of the type used in the 1830's in the first geodetic surveys in this country.

A reproduction of the celebrated clock of Giovanni de Dondi, constructed from contemporary 14th-century manuscript descriptions, was acquired in the division of mechanical and civil engineering. The original clock, which disappeared from historical account over 400

years ago, was built in Padua between 1348 and 1364. It is the earliest mechanical clock of which details survive but is in no way a primitive clock. The calendar and astronomical dials surpass by a wide margin any other known pre-Renaissance mechanism. An astronomical clock with torsion pendulum by the American inventor Aaron D. Crane was added to the timekeeping collection. This was the basis of the 400-day or anniversary clocks of modern times. An experimental model of the cesium beam atomic clock, developed at the Massachusetts Institute of Technology in 1956 by Dr. J. R. Zacharias, was also received.

A simple condensing mill steam engine built in 1819 by Thomas Holloway, of Philadelphia, was added to the collection of heavy machinery. This severely simple machine, the earliest stationary steam engine in the collection, contrasts markedly with the refinement of the Mathias Baldwin engine built in the same city only 10 years later. A model of one of the Allis-Chalmers-Westinghouse engine generators of the type built in 1904 to power New York's first subway was also added to this collection. One of the most important acquisitions of the section of tools was a multiple-spindle drill used from 1905 for the production of cash-register frames, donated by the manufacturer, the National Automatic Tool Co. Another important accession comprised a collection of tools, instruments, and documents representing the pioneering experiments in the 1920's of Prof. Orlan W. Boston, of the University of Michigan, in the investigation of metal-cutting processes.

Through the courtesy of the University of California, the division of transportation received seven important builder's half models of West coast steamers and sailing vessels built by the Dickie Yard in San Francisco. Outstanding models received were those of the Mississippi River stern-wheel steamer *Greenbrier*, the Chesapeake bay steamers *Pocomoke* and *President Warfield*, a Letter-of-Marque schooner of 1815, the ferryboat *Jersey*, South Sea Island trader *Tahiti*, Alaskan trader *Ounalaska*, a Florida shrimp trawler, and a North Carolina Sounds schooner. The two last named were received, respectively, from the Diesel Engine Sales Co. and from W. C. Matthews. The section of land transportation passed a landmark with acquisition of a full-sized example of a modern steam locomotive, No. 1401 of the Southern Railway System, which was generously donated by that company. Two important carriages were also added to the collection, a landau of 1879, from Chauncey D. Stillman, and a buckboard of 1890, from Edwin H. Arnold.

The division of electricity received from the University of Michigan 11 examples of H. N. Williams' work with the magnetron, a high-frequency oscillator, dating from the 1930's. Obtained from the Radio Corp. of America is a group of cathode-ray tubes used in the

development of television. The color television system developed in 1951 by J. M. Lafferty, of the General Electric Research Laboratory, is represented by a tube received from that company.

Individual items of importance added to the electrical collections were printing telegraphs, received from the Western Union Telegraph Co. and the Netherlands Postal Museum; a set of Pupin loading coils arranged to simulate the telephone circuit from New York to Boston, from the Armstrong Memorial Research Foundation; the Sorensen vacuum switch for power circuits, from Prof. R. W. Sorensen; and the radio sextant developed by the Collins Radio Co., transferred by the U.S. Department of the Navy.

The division of medical sciences acquired from the University of Illinois the remarkable Edward H. Angle collection of dental instruments and related material, and from Dr. Julius Lempert a collection of otological instruments representing Dr. Lempert's well-known work in that field.

Arts and manufactures.—The division of textiles received an excellent collection of 10 examples of buratto and drawnwork lace of the 16th through the 19th century, presented by Miss Harriet Winslow. Mrs. Beatrice E. Baker added a group of beautiful costume laces to this collection. Mrs. W. A. Pickens presented a "Feathered Star" quilt made by the wife of Gen. Mordicai Gist. Dr. and Mrs. Leonard Carmichael donated several interesting examples of silk embroidery on wool, used for infant wear. Three excellent needlepoint pictures, lent to the division several years ago, were bequeathed to the Museum by the late Crystal Palmer. These fine examples were made by Miss Palmer's grandmother in the mid-19th century. An interesting sewing machine, an 1859 West and Willson model, a type not previously represented, was donated by Mr. and Mrs. L. E. Isaacson.

The division of ceramics and glass received a collection of rare 18th-century porcelain, donated by Dr. and Mrs. Hans Syz, of Westport, Conn. Important pieces in this group include a Boettger tankard of red stoneware, 1712–15; a Boettger white porcelain bowl with applied decoration of rose buds and leaves, 1715; and a Viennese porcelain trembleuse cup and saucer, 1730–35. To her previous gift Mrs. W. A. Sutherland has added 25 pieces of fine porcelains, including 2 rare Bow mugs, 1760, and an unusual Chelsea dish, 1752.

A magnificent example of printing, *The Works of Geoffrey Chaucer*, printed in 1896, was presented to the division of graphic arts by the Honorable Clinton P. Anderson, a Regent of the Smithsonian Institution. Known as the *Kelmscott Chaucer*, the book is the handiwork of William Morris, whose concern with fine craftsmanship resulted in a revival of high standards in industrial design. Another impor-

tant accession is a lithograph, *Divertissement d'Espagne*, by the Spanish artist Francisco Goya. The gift of Albert H. Gordon, of New York City, through E. Weyhe, Inc., this rare and valuable print is one of a set of four bullfight subjects that is considered the first great product of lithography.

Among the important prints obtained were two separate states of the lithograph *Il tombe dans l'abime*, by the French artist Odilon Redon; three lithographs from *Campaign Sketches* by Winslow Homer, the American artist who documented the Civil War, *A Pass Time* (*Cavalry at Rest*), *Foraging*, and *The Baggage Train;* two color aquatints, *Juggler* and *Ballerina*, by Georges Rouault; five rare lithographs by outstanding American contemporaries, *Brown Moons* by Helen Frankenthaler, *Poet I* by Robert Motherwell, *Last Civil War Veteran* by Larry Rivers, *Speaker* by Robert Goodnough, and *Coathanger* by Jasper Johns; two chiaroscuro woodcuts, *The Visitation* after Annibale Carracci and *Statuette of Neptune* after Giovanni da Bologna, by John Baptist Jackson, the 18th-century master of the color woodcut.

Among the fine examples of photographic equipment and prints acquired by the section of photography was a Cinematographe, invented in 1895 by Auguste and Louis Lumière of France. This was one of the earliest devices to take and project (perforated) motion-picture film. The section also acquired an important collection of apparatus invented by Frederic Eugene Ives, of Philadephia, a pioneer in color photography. This group includes an Ives Lantern Kromskop, made about 1890, the first practical device to use 3-color separation positives for projecting full color on a screen; a group of slides for this projector; an 1894 Ives photochromoscope Kromskop stereo camera and viewer, and a large number of Kromogram slides for use in the viewer. The Kromskop System offered a method for taking color separation stereo pictures and viewing them in full color.

Of particular interest among specimens received in the division of manufactures and heavy industries are some of the first stampings of aluminum made from the first commercial production of the Hall process. These, presented by the Scovill Manufacturing Co., will shortly be shown in a special exhibit which will include the first globules of aluminum produced by Charles Martin Hall in February 1886. Another important acquisition is a Winsted machine which was built prior to 1873 and which was in active use at the American Brass Co.'s plant at Waterbury until 1961. Dr. W. L. Libby donated to the section of nuclear energy the experimental equipment used in his pioneer work to establish the dates of archeological material by carbon-14 dating. Two of the first X-ray tubes to be made in America were donated by the Catholic University of America. The section of iron

and steel obtained the first steam hammer erected in the United States, built by Nasmyth between 1851 and 1856 and in use at Taylor-Wharton Iron & Steel Co., High Ridge, N.J., until 1935. The first wide-flange universal beam mill to be erected in the United States was presented by the Bethlehem Steel Co. The United States Steel Corp. donated the pilot model of a Lorig aligner, an important innovation which speeded up the handling of strips of metal in continuous mills.

The division of agriculture and forest products acquired a water-powered sawmill including the building, waterwheel, shafting, and gearing. The mill, a fine representative of 18th- and 19th-century sawmills, operated an up-and-down saw and moved a 30-foot-long carriage against the saw. The New Holland Machine Co. gave a small portable gasoline engine of the early 20th century, used to drive machines such as grinding mills, saws, etc.

Civil history.—The division of political history received the personal memorabilia of President and Mrs. Woodrow Wilson. A black satin dress, worn by Edith Bolling Wilson the first time she dined at the White House and a white silk dress she wore at a diplomatic reception in 1916, her first appearance at a state occasion at the White House after her marriage, were among the items received from Mrs. Wilson's estate through her personal secretary, Mrs. Margaret C. Brown. Mrs. Joseph P. Kennedy donated a white silk gown decorated with gold and silver sequins worn by her when she was presented at the Court of St. James when her husband was Ambassador to Great Britain. The dress was worn again in 1961 at the Inaugural Ball of her son, President John F. Kennedy. Ralph E. Becker continued his donations from his important campaign collection. The most significant of these is a painted banner, bearing a portrait of Thomas Jefferson, celebrating his victory in 1801. An exciting silk campaign banner carried by the "Downers Grove Plough Boys," a Republican marching club of 1860, was given by Elbert A. Rogers, Downers Grove, Ill. A 3-sided transparency, containing a portrait of Abraham Lincoln and campaign mottoes of 1860, was donated by Mrs. Robert A. Hubbard, Walpole, N.H. Made of cloth and wrapped around a wooden frame, the transparency, with torch inside, was carried on a pole in political parades. Another significant acquisition was the Adelaide Johnson Collection donated by Mrs. Elizabeth Johnson Cristal, a niece of Mrs. Johnson. Adelaide Johnson, a devoted feminist, was best known as the sculptress of the Women's Rights movement. The robe worn by Charles Evans Hughes as Chief Justice of the Supreme Court was received from the New Canaan Historical Society through Dorothy Cocks, New Canaan, Conn.

Noteworthy donations to the collections of the division of cultural history include two early-19th-century blown-glass whale-oil lamps,

a 17th-century brass *couvre-feu*, and other domestic objects, from Preston R. Bassett; a set of champfered oak bed posts of a hitherto unidentified type of 17th-century Massachusetts bedstead, the gift of Virginia Beets; five paintings, 19th-century American, by E. L. Henry and Eastman Johnson, given by Mrs. Francis P. Garvan; and five diorite door and marker stones with primitive carved designs and dates, from the site of a mansion built by Lt. Gov. William Dummer of Massachusetts in Byfield in that State, donated by Mr. and Mrs. Stephen Twaddell.

The division of philately and postal history received a specialized collection of the famous La Guaira local stamp. These issues, authorized by the Venezuelan Government, were prepared by Waterlow & Sons for the mail carried by steamship between La Guaira, Puerto Cabello, and St. Thomas beginning in 1864. L. W. Christenson, of Cleveland Heights, Ohio, gave a collection of the issues of Manchukuo and of the Ryukyu Islands, which include postal stationery, booklets, covers, and a number of reference books. James A. Farley, former Postmaster General, donated a number of new covers. Dr. Joseph H. Kler, of New Brunswick, N.J., gave an initial portion of his prize-winning topical collection of stamps pertaining to Rotary International and placed the balance on loan. In eight albums are mounted many full sheets, singles, blocks, and many covers bearing appropriate cancels and cachets. Included also are several preliminary artist's drawings, some printer's proofs, and the Monaco color-error essay.

The most outstanding additions to the numismatic collections are the original obverse and reverse dies prepared in 1861 by Robert Lovett, Jr., of Philadelphia, for the proposed striking by the Confederacy of a copper cent, an issue which never materialized. The dies, two hubs made from the original dies, and other material in connection with the restrike of the Confederate cent in 1962 were received from Robert Bashlow, of New York. A rare 1916 pattern half dollar, a gift of Benjamin M. Douglas, and a silver ingot put out by the Nevada Silver Co. in 1876, a gift of Harvey Stack, of New York City, are also notable. A collection of 436 Polish gold, silver, and copper coins and medals was donated by Christian Zabriskie, of New York. This remarkable collection was started in the 1870's by the donor's father, Andrew Zabriskie, a noted United States numismatist. To his previous donations of Russian coins and medals coming from the famous Grand Duke Mikhailovitch collection, Willis H. duPont added another significant group of 860 specimens, including many exceedingly rare pieces issued during the reigns of Czar Ivan III and Czarina Elizabeth (1740–62). An interesting group of Babylonian and Sumerian clay tablets recording commercial transactions was given by I. Snyderman, of New York. Pietro Giampaoli, chief en-

graver at the Rome Mint and one of the foremost medal engravers in the world, donated a select group of his own medals exemplifying various stages in his artistic evolution. A modern silver medal of exceptional artistic merit, issued by the Maison Carrée of Nîmes in 1961, was given by the Honorable Claiborne Pell, Senator from Rhode Island.

Armed Forces history.—A unique 1842 pattern musket and set of Ordnance Department inspectors' verifying gauges were received in the division of military history from William H. Guthman. A rare 13-inch bomb fired by the British fleet at the time of its attack on Alexandria in 1814 was received from the Department of the Army. Through the courtesy of Adm. Sir John Moore, the Victoria Cross and associated service medals awarded Private John McGovern for gallantry during the Indian Mutiny were deposited as a long-term loan from the Royal United Service Institution. Also received on loan, from David N. Rust, was a rare cavalry saber made by John Potter and formerly owned by Col. George Baylor, aide-de-camp to George Washington.

A significant addition to the Museum's extensive flag collections is the 48-star national ensign that served as the official flag of the 1960–61 Antarctic Expedition on its traverse from Byrd Station to the South Pole, presented by Rear Adm. David M. Tyree through Rear Adm. William Rea Furlong.

An important collection of objects recovered from Bermuda shipwreck sites dating from about 1621 to 1914 was added to the collections through the field work of head curator Mendel L. Peterson, in cooperation with E. B. Tucker and the Government of Bermuda.

The year's most important accession in the division of naval history is the Continental gundelo *Philadelphia*. The oldest major American naval relic of the Revolutionary War, the gundelo reached final moorings early in December 1961, when it was moved into the new Museum of History and Technology. A shot-scarred survivor of Benedict Arnold's gallant flotilla that opposed superior British invasion forces on Lake Champlain, this flat-bottomed gunboat was sunk at the Battle of Valcour Island on October 11, 1776. For nearly 159 years the *Philadelphia* lay on the muddy bottom of Valcour Bay, before it was located and raised intact in 1935 through the skillful efforts of Col. Lorenzo F. Hagglund, of New York, who donated the historic warship. Over 700 objects were recovered from the 54-foot gundelo, including her entire main battery of 9″ and 12-pound guns, with their original carriages, as well as numerous other items of ship's equipage and the crew's gear. Brought to Washington with the generous assistance of the United States Coast Guard and the United States Navy, the oaken-hulled *Philadelphia* will shortly enter another episode in

her long career, that of transporting the Smithsonian Institution's visitors vividly and intimately to that precise moment in the nation's history when this shattered warship, having fired her last shot in our struggle for independence, slid quietly beneath the waters of Lake Champlain.

Notable among early 19th-century naval accessions is an oil painting by Michele Felice Corne, depicting the engagement in 1812 between the *Constitution* and the *Java*, donated by Mrs. Mabel P. Garvan. The Department of the Navy provided two early boarding pikes and a pair of mid-century gangway headboards, on indefinite loan. Valuable light on the emergence of the steam Navy and its Corps of Engineers is provided in the professional correspondence (1847–67) of Chief Engineer James M. Adams, USN, donated by his great grandson, James Adams Knowles. Submarine operations during the Civil War are represented by a superb model of the Confederate submersible *H. L. Hunley*, constructed and presented by Floyd D. Houston, of New Suffolk, N.Y.

EXPLORATION AND FIELDWORK

Dr. T. Dale Stewart, head curator of anthropology, participated in a conference on "Anthropology and the Conditions of Individual and Social Freedom," held at Glognitz, Austria, in August, and also studied specimens of particular interest to him at the Paleontological-Geological Museum at Zagreb, Yugoslavia.

A late Pleistocene bone bed with possible human associations, near Littleton, Colo., was under study last year by Dr. Waldo R. Wedel, curator of archeology, and Dr. C. Lewis Gazin, curator of vertebrate paleontology. This study was resumed in the summer of 1962. Artifacts have been found to a depth of about 40 inches, in association with bison bones. None has yet been found in the lower level where bones of camel and mammoth are more plentiful, indicating that these species may have been the characteristic fauna. The hints of stratification in the faunal remains raised the hope that some sort of cultural stratification will eventually turn up as well. The field party, in charge of George S. Metcalf, museum aide, will continue its work through the summer of 1962.

En route to a site for field work in Ecuador, Dr. Clifford Evans, associate curator of archeology, and his wife, Dr. Betty J. Meggers, honorary research associate, attended a training conference in archeological techniques at Barranquilla, Colombia, in June and early July 1961. The conference had been planned and organized in cooperation with the Pan American Union and was conducted at the Universidad del Atlántico. Young, qualified archeologists came from Argentina, Brazil, Chile, Guatemala, Mexico, Panama, Peru, Uruguay, and Vene-

zuela to participate, and a highly successful interchange of knowledge resulted.

Continuing to Ecuador, Drs. Evans and Meggers spent nearly 3 months in a continuing field study being conducted in collaboration with Emilio Estrada. Aspects of archeology investigated included pre-ceramic horizons, Valdivia culture, Jambelli culture, Mexican cultures in Ecuador, Manteño culture, and Milagro Period burials. The Smithsonian archeologists brought back 59 large boxes of specimens in addition to many notes and data on classified pottery for at least eight stratum cuts of material. Numerous developed and cataloged photographs, both black and white and in color, will be invaluable in working up the results of this expedition.

For a period of nearly 6 months, Dr. Gus W. Van Beek, associate curator of archeology, conducted archeological field work in Wadi Hadhramaut, East Aden Protectorate. He was accompanied by Dr. Glen H. Cole and Dr. Albert Jamme, and Dr. Henry W. Setzer, of the Museum's division of mammals, joined the group for 1 month to collect mammals in the Wadi Hadhramaut region. For 3½ months without interruptions the field party conducted its survey in Hadhramaut, systematically surveying the main wadi from Terim to Shibam (this portion of the wadi is approximately 40 miles long and from 1½ to 4 miles wide) and, more superficially, an additional 40 miles of the western part of the main wadi, from Shibam to Qarn Qaimah beyond Henin; they covered the major portions of all tributary wadies in the region.

Dr. Cole's work on prehistoric sites proved to be highly significant. His was the first systematic work in prehistory ever done anywhere in the Arabian Peninsula, and he should be able to provide a framework for Arabian prehistory and to draw tentative conclusions regarding the affinities of the Arabian industries with those of surrounding regions in Africa and Asia.

Dr. Van Beek discovered and recorded approximately 50 sites, of which 23 are pre-Islamic and 27 Islamic. The pre-Islamic sites range in date from about the 11th or 10th century B.C. to the 7th century A.D., and the Islamic sites from the 7th century A.D. to the present. Some of the pre-Islamic sites are extremely impressive, measuring as much as half a mile long by a quarter of a mile wide. For the most part they consist of good stone masonry, and many structures still have mud-brick walls on masonry podia. On the eroded surface of the sites are vast quantities of potsherds and many fragments of architecture, sculpture, and ancient South Arabic inscriptions in stone. Previous to the work of the expedition, the earliest known occupation of Hadhramaut was the 5th century B.C.; by discovering sites going back to the 11th or 10th centuries B.C., the party has pushed back

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the date of human occupation some five or six centuries in the Hadhramaut.

Dr. Jamme copied more than 1,000 graffiti in the main wadi and in tributary wadies. Before his work, no more than 60 or 70 graffiti were known in this entire area and these were on only two rocks. The information thus gained will add enormously to our knowledge of the history of Hadhramaut in pre-Islamic times.

The material collected by Dr. Setzer is the first of its kind from Arabia in the National Museum collections. From an archeological point of view, this collection of mammals will be extremely useful for identifying bones recovered in excavations in this region.

Dr. Van Beek and other members of his party were delighted by the warm reception and excellent relations they enjoyed in Aden and Wadi Hadhramaut. The American Consulate, the British Director of Antiquities for the Colony, the Royal Air Force, the Protectorate Secretary, the Residency Staff in Mukalla and Seiyun, and the officials of the Kathiri State in Seiyun and the Qu'aiti State in Hadhramaut were all extremely cooperative.

En route to and from Aden, Dr. Van Beek visited several institutions and met archeological colleagues in England, Italy, Sudan, Ethiopia, and Jordan. Discussions were very profitable along the lines of mutual research and also in connection with the exhibits program of the Smithsonian, where a new hall of Old World archeology is in the planning stage.

For 2 months of the summer of 1961, Dr. Marshall T. Newman, associate curator of physical anthropology, continued his now nearly completed nutritional study of more than 100 schoolboys of Vicos, Peru. He was accompanied by Dr. William J. Tobin, collaborator of the Smithsonian Institution, and Mrs. Tobin. For several years Dr. Newman and Dr. Tobin have been collaborating with staff members of the Instituto de Nutrición of Lima in this project. Analyses of the data obtained are necessarily complicated, but in a preliminary way the following conclusions are now apparent: Mean weight gains as viewed longitudinally have increased 19–53 percent, depending on the school year, since the school-lunch program started. Stature increases do not appear to be similarly affected. Clinical signs of vitamin and mineral deficiencies declined grossly from 1956 to 1961, and mean hemoglobin levels are up from 13.16 to 14.24 gm/100 ml. Almost all the Vicos boys are within the normal serum calcium limits, but 21 percent are still low in vitamin A and 8 percent are low in serum carotene. An analysis of the detailed metric data is proceeding, and the bone density figures from the X-rays are expected to be available in the near future.

In April Dr. Horton H. Hobbs, Jr., head curator of zoology, under-

took a collecting trip through parts of northwestern Georgia, northern Alabama, and Tennessee. While assembling more than 1,500 specimens of crayfishes, Dr. Hobbs intensively surveyed the Hiwassee drainage system in North Carolina and Georgia, the Tennessee River system in northern Alabama, and the Cumberland in northern Tennessee. It is hoped that the materials collected in these areas will be helpful in clarifying several problems in the genus *Cambarus* that have puzzled students of crayfishes for some 60 years.

In October Dr. Henry W. Setzer, associate curator of mammals, accompanied by museum aide Gary L. Ranck, traveled to Benghazi, Libya, to begin field work on the mammals of Libya. With the aid of every courtesy and cooperation from the 64th Engineer Battalion (Base Topographic Survey), the Smithsonian field party made substantial collections in Libya. Toward the end of November Dr. Setzer went to Aden to join Dr. Van Beek in the Wadi Hadhramaut, leaving Mr. Ranck to carry on studies of the mammals of Libya, which he continued throughout the fiscal year. In Aden, Dr. Setzer spent 4 weeks collecting small mammals and attempting to obtain skeletons of larger mammals for comparative purposes, in connection with the archeological research conducted by Dr. Van Beek.

For 3 months, between January and April, Dr. Charles O. Handley, Jr., associate curator of mammals, continued his long-term study of the mammals of Panama. During this period nearly 2,000 mammals, together with their ectoparasites, as well as several hundred specimens of birds, reptiles, amphibians, fishes, and snails, were preserved. Two previously unsampled faunas were studied: in the high mountains at the southern tip of the Azuero Peninsula and in the islands off the coast of Bocas del Toro. In addition a good high-elevation collection was made in Chiriquí, and previous collections at Cerro Azul were supplemented. During this field study Dr. Handley was assisted by F. M. Greenwell, of the Smithsonian's office of exhibits. Invaluable local assistance in Panama was furnished by the Gorgas Memorial Laboratory and by military services that provided transportation facilities.

In June Dr. Handley spent a few days collecting small mammals in extreme southwestern Virginia. His particular intent was to search for the northern limits in the Appalachian region of some rodents of the Mississippi Valley which have been shown in other areas to be expanding their ranges. As an example, a specimen of the cotton-rat *Sigmodon hispidus* was collected at Ewing, Va., well north of the previously known limit of its range in Tennessee.

Field work on the survey of the geographic distribution and variation of the birdlife of the Isthmus of Panama, under Dr. Alexander Wetmore, honorary research associate and retired Secretary of the

Smithsonian Institution, covered the period from January 3 to April 5, 1962. The month of January was devoted to the valley of the Río Guánico at the southern end of the Azuero Peninsula, a region previously not studied, with shorter trips to the marsh areas in the savannas east of Pacora, and to an area between the Trans-Isthmian Highway and the eastern boundary of the Canal Zone. Early in February work continued in the lower valley of the Río Bayano, with interesting results. Following this the party moved to the Province of Coclé near the Veraguas boundary. In addition to work in the lowlands and the foothill region, one camp was made in rain forest on the Caribbean slope of the continental divide. Three hours distant by trail to the south the vegetation was brown and dry, as is normal on the Pacific slope in the height of the dry season, while at the Tigre camp rain fell daily and the forests were dense and green. Specimens taken here included a number of birds that are little known. Other collections in this region were made during a survey by Jeep of the savannas near the sea, and trips in a dugout canoe to the mangroves in the extensive swamp lands at the mouth of the Río Pocrí.

Dr. Wetmore's final field trip of the season, in the latter half of March, was a survey of the islands that lie between Isla Coiba (visited in 1956) and the Pacific coast of Veraguas and Chiriquí. The party traveled and lived on the launch *Barbara II*, handled expertly in these rough waters by Capt. George Edgington and his companion William Bailey. On this expedition it was finally possible to identify the sooty terns that come to nest on the rocky islets Frailes del Sur off Punta Mala. Collections were made also on the islands Canal de Afuera and Afuerita, and on Brincanco in the Contreras group. All are forested, rock-bound, and uninhabited, with landings possible only on a few tiny beaches. The final specimens were taken on the western end of Isla Cebaco, from an anchorage in the sheltered bay Caleta Cayman. Affinities of the few resident land birds of these islands appear to be with the peculiar forms of Isla Coiba farther at sea, rather than with the adjacent mainland. Throughout this travel Dr. Wetmore had as assistant Rudolfo Hinds, technician from the Gorgas Memorial Laboratory, who made blood smears from all specimens taken, to be checked for incidence of tropical disease.

Bernard R. Feinstein, museum aide in the division of birds, completed in September 1961 the field work that he had begun in August 1960, under the auspices of the U.S. Army Medical Research and Development Command and the Bernice P. Bishop Museum. During the period of his operations, Mr. Feinstein obtained specimens of 1,070 mammals and 1,300 birds, in addition to a number of reptiles. The vertebrate collections include much topotypical material. Areas visited included regions in Viet Nam and Cambodia.

After attending the Tenth Pacific Science Congress in Honolulu, Dr. Leonard P. Schultz, curator of fishes, spent a few days in September on the island of Hawaii, where he made ichthyological observations of the offshore waters. He was impressed by the paucity of reef fishes here in comparison with similar areas in the Pacific.

In May and June Dr. J. A. F. Garrick, research associate in the division of fishes, spent a week in the Bahamas at the invitation of the International Oceanographic Foundation examining sharks during a cooperative operation with the anglers in the Grand Bahama Bluefin Tuna Tournament. Several sharks were taken, including an adult of *Carcharhinus springeri*, which is of considerable interest because presently only juveniles of this species are available in museum collections. A complete set of measurements and vertebral counts were made on this and other specimens.

In September and October Dr. J. F. Gates Clarke, curator of insects, after attending the Tenth Pacific Science Congress in Honolulu, conducted entomological field work in the South Pacific. Although it proved impossible for Dr. Clarke to reach his principal objective, the island of Rapa, because of adverse weather conditions, he made collections of insects and other arthropods on the islands of Tahiti and Huahine. In the material thus acquired, there seem to be many species of Microlepidoptera which are new to the national collections and some of which are doubtless undescribed.

In August William D. Field, associate curator of insects, spent 2 weeks in the Great Smoky Mountains National Park primarily to obtain specimens of the genus *Rhopalocera*. Forty species of butterflies were collected, of which several were unusual and rare, including *Speyeria diana* and *Lerodea neamathla*. At the close of the fiscal year Mr. Field was engaged in field work in Maine, collecting specimens of *Rhopalocera* for the Museum and conferring with several local collectors with regard to future contributions to the Smithsonian's entomological materials.

Dr. Oliver S. Flint, Jr., associate curator of insects, made a successful collecting trip to Puerto Rico in August. As a result, the Museum collections now possess the immature stages of all species of caddisflies known to occur on the island. In addition, the lengths of the adult series were increased and several species previously unknown were collected. The trichopteran material, which contains at least 2 new genera and over 12 new species, will be studied and reported upon. A considerable collection of Odonata, both adults and naiads, was made.

At the end of the fiscal year, Dr. Donald F. Squires, associate curator of marine invertebrates, and Thomas G. Baker, of the office of exhibits, were still engaged in field work in New Caledonia. The Smithsonian

party began its work on that island early in May, continuing the acquisition of specimens and data for a coral-reef group being planned for the new Hall of Oceanic Life. They were successful in obtaining an adequate supply and variety of corals to reconstruct a typical New Caledonian reef. Other representative elements of the fauna were also obtained and shipped back to the Museum.

For approximately 9 weeks between January and April, a Smithsonian Institution party conducted field work in the interior of British Guiana for the purpose of obtaining data, specimens, and models for the construction of a rain-forest life group in the proposed Hall of Plant Life. Dr. Richard S. Cowan, associate curator of phanerogams, served as leader of the expedition and technical adviser to the group, which consisted of Dr. Thomas R. Soderstrom, associate curator of grasses; Reginald J. Sayre, of the office of exhibits; and Paul Marchand, modelmaker. In addition to a large number of collections of plant materials, 2,500 color slides were made and 5,000 feet of 16-mm. film were exposed by Dr. Soderstrom. Mr. Marchand prepared numerous life-size models of different species of plants which can be duplicated as desired for use in the life group. Mr. Sayre made field sketches and paintings of many of the items that will be used in the exhibit, as well as a scale painting of Kaieteur Falls that will serve as a guide in preparing the background of the group. Numerous plant materials were preserved to serve as specimens from which to make additional models. In the time that was available from the exhibit functions of the trip, Dr. Cowan and Dr. Soderstrom obtained ample material of about 500 species of plants for scientific purposes.

In April and May Dr. Velva E. Rudd, associate curator of phanerogams, visited museums in Trinidad, Venezuela, and Panama, in continuation of her studies of *Ormosia* and other Leguminosae. She conducted field studies at certain interesting botanical localities, including Colonia Tovar, El Avila, and Parque Nacional Henri Pittier in Venezuela, as well as the Canal Zone Biological Area in Panama.

In April Dr. John J. Wurdack, associate curator of phanerogams, began extended botanical field work in Peru. After assembling his supplies and equipment in Lima he traveled to Chachapoyas in northern Peru, headquarters for the first part of the trip. At the end of the fiscal year Dr. Wurdack reported that his work was progressing satisfactorily and that he was amassing large collections for the Smithsonian's department of botany. One of his objectives is to recollect some of the species very inadequately known through the pioneering collection of the British botanist Mathews nearly a century ago. Many species obtained at that time have not been rediscovered, primarily because travel in the mountains of northern Peru is difficult. Dr. Wurdack will particularly emphasize research collections of his own specialty, the family Melastomataceae.

In October and November Dr. Thomas R. Soderstrom, associate curator of grasses, made extensive collections of plants in the state of Michoacán, Mexico, in collaboration with Robert King, of Texas, who is spending a large part of this year at the Smithsonian Institution. Thorough collections of the flora were made in six diverse localities in Michoacán. Special emphasis was placed on study of the grasses, and the material obtained will be incorporated in a taxonomic revision of the grasses of Mexico, upon which Dr. Soderstrom is now embarking.

In August, prior to attending the Tenth Pacific Science Congress in Honolulu, Dr. William L. Stern, curator of woods, collected wood samples and herbarium material mostly in the mountain forests of Kauai, Hawaii. It was possible to visit the poorly collected Na Pali Kona coast of Kauai, where Dr. Stern and Dr. Sherwin Carlquist, of the Rancho Santa Ana Botanic Garden, gathered specimens of the monotypic lobeloid *Brighamia insignis*, as well as other rare plants. On his return trip, Dr. Stern visited colleagues in Oregon and Colorado and spent several days in the field making collections of wood samples and herbarium vouchers. In continuation of his study of the flora of the Florida Keys, Dr. Stern spent 2 weeks in December and January making collections of wood specimens and herbarium material at Key Largo, Big Pine Key, Grassy Key, and Crawl Key.

In June and July 1961 Dr. G. Arthur Cooper, head curator of geology, and Dr. Richard E. Grant, of the U.S. Geological Survey, continued their field studies in Texas and New Mexico. In the vicinity of Marathon, Tex., much of their time was devoted to examining the lower limestone of the Word formation, which proved to be a key bed in their studies, and collecting from it at about 20 localities. Subsequently the field party spent some days at Van Horn working in the Lower Permian Huaco formation, where they collected from the Capitan limestone and its equivalents, their objective being to obtain a good representation of this fauna to use in comparative studies with their Glass Mountains fossils. This field season essentially completed the coverage of the Glass Mountains area for collecting purposes by Dr. Cooper and Dr. Grant.

In October Edward P. Henderson, associate curator of mineralogy and petrology, went to the vicinity of Henagar, Ala., to prospect for a meteorite which had first been discovered in 1959. Although the main mass of this meteorite had been removed, Mr. Henderson, using a sensitive metal detector, prospected 5 acres of ground and located one sizable piece and several smaller fragments. A second trip took Mr. Henderson to Fort Worth, Tex., to investigate reports about a meteorite that fell there on September 9, 1961. With the aid of Oscar Monnig, field work was organized, and after many hours' search the party located a small piece of the meteorite, which is now on deposit in the national collections.

In April Dr. Richard S. Boardman, curator of invertebrate paleontology and paleobotany, spent several weeks collecting bryozoans from the Simpson group of lower Middle Ordovician age in the Arbuckle Mountains of Oklahoma. The fauna of this region is largely unstudied and has the advantage of starting with the earliest known bryozoans in this country and continuing through a long period of time. This sequence should reveal evolutionary details and the origins of several genera. The faunas are abundantly represented throughout and will support many detailed population studies.

Dr. Porter M. Kier, associate curator of invertebrate paleontology and paleobotany, accompanied by Dr. Druid Wilson, of the U.S. Geological Survey, over a period of several weeks in Florida in November and December, collected fossils from formations of probable Miocene and Pliocene age. The collecting was spectacular, providing a much larger fauna than anticipated. Over 2,000 specimens were found, representing approximately 25 species, most of which are new. The results of the study of these specimens should be most helpful in determining the age of the formations. Subsequently, Dr. Kier collected and studied living sea-urchins and sea-biscuits in the vicinity of Miami. Using aqualung equipment, he spent many hours on the sea floor observing the behavior of nine species of echinoids, anticipating that these studies will permit a better understanding of the ecology of the fossil forms that are his particular interest.

In February Dr. Kier and Dr. Erle G. Kauffman, associate curator of invertebrate paleontology and paleobotany, spent several weeks in Saudi Arabia collecting fossils under the sponsorship of the Arabian American Oil Co. With the aid of officials of this company, they made extensive collections in central Saudi Arabia, where three camps especially erected for the expedition gave access to fossiliferous Lower Cretaceous, Upper Cretaceous, and Jurassic areas. The operations were extremely successful, and the Smithsonian party obtained over a ton of well-preserved Mesozoic fossils, including approximately 8,000 brachiopods, 30,000 mollusks, 1,500 echinoids, and numerous corals and sponges, many of them new to science. The material collected from carefully measured stratigraphic sections will be invaluable to Middle East biostratigraphic work and an excellent source for evolutionary studies.

In June Dr. Kier, in company with Dr. Druid Wilson, worked for a few days in the Miocene formation near Cape Fear, N.C. The scientists were fortunate in collecting sufficient echinoids and mollusks to enable them to date these beds and in turn to date the Caloosahatchee formation.

In the summer of 1961 Dr. Kauffman conducted field work in Montana, Wyoming, Utah, Colorado, and New Mexico. He collected

large suites of fossil mollusks and worked out a refined biostratigraphic zonation of the Upper Cretaceous rocks in these areas. The ultimate purpose of the project is widespread regional correlation, based on mollusk zones, of Upper Cretaceous deposits throughout the Western Interior of North America, with special emphasis placed on the role of pelecypods as time-zonal indicators. The success of the summer field season far exceeded Dr. Kauffman's expectations. Collections superior to any previously made were obtained at numerous localities and include a wealth of new species and new faunas. Refined biostratigraphic zonation of key Upper Cretaceous sections was accomplished. Regional studies in central and eastern Colorado are now near completion, making possible future expansion to Kansas, New Mexico, western and northern Colorado, and Wyoming.

In April Dr. Richard Cifelli, associate curator of invertebrate paleontology and paleobotany, joined the oceanographic vessel *R. V. Chain* of the Woods Hole Oceanographic Institution. The vessel cruised to the Nova Scotia shelf at longitude 65° W., and then proceeded due south to St. Thomas. Stations were occupied at each degree of latitude and the Gulf Stream. Collections of Foraminifera from oblique, 200-meter plankton tows were made at each station. A total of 24 samples were collected, representing excellent coverage for the western Sargasso Sea and adjoining waters.

Between July and September Dr. C. Lewis Gazin, curator of vertebrate paleontology, accompanied by Franklin L. Pearce, chief of the laboratory of vertebrate paleontology, made an extended collecting trip through several Western States. Their first stop was at Littleton, Colo., where they joined the Smithsonian group carrying on a combined paleontological-archeological excavation in a quarry south of Littleton. In subsequent field work near Shoshoni, Wyo., they made collections at Paleocene, Lysite lower Eocene, Badwater upper Eocene, and Cameron Springs lower Oligocene localities in the Wind River Basin. Also in Wyoming near Kemmerer, their work had excellent results at a new locality for Paleocene mammals in the Evanston formation, as well as at the previously discovered locality in this formation near Fossil Butte. Continuing into Montana, the party spent a fruitful period at the well-known lower Oligocene locality at Pipestone Springs. At the conclusion of this field season, Dr. Gazin and Mr. Pearce returned to Littleton, Colo., to assist in the packing and shipping to Washington of some 4 tons of fossil materials, mostly mammoth, obtained by the party working on the Littleton project.

Between February and May Dr. Gazin conducted research in Guatemala, Nicaragua, Argentina, and Brazil. In Guatemala, at the request of and with the support of the Government of Guatemala,

he visited several localities where fossil vertebrate remains had been found. Undoubtedly the most significant of these was a rather extensive area, evidently of lake-deposited volcanic ash, in and around the town of Estanzuela, near Zacapa in eastern Guatemala. Remains of mastodon and giant sloth were observed in place. During his short stay in Nicaragua Dr. Gazin examined a locality on the banks of the Río Viejo, to the north of Lake Managua, where Pleistocene mammal remains were encountered. These included teeth of horse, bison, and mastodon, and a pair of toxodon jaws. While in South America, Dr. Gazin spent extended periods at Buenos Aires, La Plata, and Rio de Janeiro, pursuing his studies of early Tertiary mammals.

Dr. Nicholas Hotton III, associate curator of vertebrate paleontology, left in February 1961 for South Africa for a collecting season in the famous Permian Karroo beds. His work extended through July 1961 and proved to be extremely successful. Accompanied by J. W. Kitching, of the Bernard Price Institute for Paleontological Research, University of the Witwatersrand, he covered more than 4,000 miles in the Karroo area. Starting from Johannesburg, the party spent some weeks on the east flank of the Drakensberg Mountains, collecting fossils from the upper part of the Beaufort series. From there they went to the classic area of the uppermost Beaufort, around Burgersdorp and Lady Frere, where they completed another 2 weeks of successful collecting. Gradually they worked their way westward across the Karroo, a course that took them downward stratigraphically. The collection consists of nearly 200 specimens, which will be added to the material of the National Museum. Many of the specimens are of exhibit quality.

The greatest importance of the collection lies in its being representative of the Permo-Triassic synapsid fauna of Africa and in its high proportion of good anatomical specimens. It is believed that excellent coverage of the Beaufort series was achieved both horizontally and vertically. The collection of *Cynognathus* zone material is particularly complete, and there are a number of relatively rare upper *Lystrosaurus*-zone theriodonts. In addition, the genera *Lystrosaurus* and *Diademodon* are represented by several individuals from a variety of stratigraphic levels and geographic locations. Further progress in understanding taxonomic and ecological relationships of the Beaufort synapids depends upon more accurate stratigraphic data than are currently available in the literature. However, it is expected that the data obtained by Dr. Hotton and Dr. A. S. Brink, scientific officer of the Bernard Price Institute, from various sources will be valuable in marking out approaches to an ultimate solution.

In September Dr. Hotton worked several days in the vicinity of Wichita Falls, Tex., examining collections of Permian amphibians

discovered by Dr. Sergius H. Mamay, of the U.S. Geological Survey. The material in this vicinity probably represents the last vestiges of a drying pond or river waterhole, in which the amphibians were trapped and preserved. It consists of about 2½ tons of siltstone matrix containing perhaps 150 skulls and scattered postcranial remains; the bones range all the way from impressions to complete elements. Although preservation of some of the specimens leaves something to be desired, the collection as a whole is remarkable. For obtaining much of this valuable material and shipping it to the Smithsonian Institution, credit must go to Dr. Walter W. Dalquest, of Midwestern University. The fossil locality itself is in Haskell County, about 150 miles from Wichita Falls.

During the year staff members of the Museum of History and Technology and the Office of Exhibits made many short and a few extended field trips in order to examine collections of potential usefulness in developing the new exhibit halls of the Museum. During field work of this sort, the staff members carry out essential assignments of appraising the potential of objects to the research programs in history and technology, as well as their possible value to the exhibits program. While all such trips are of importance to the development of the Museum, only a few visits to institutions outside the United States are here discussed.

In August Dr. Wilcomb E. Washburn, curator of political history, visited numerous museums and historic buildings in and near Athens, Vienna, Paris, and Rome, to familiarize himself with the latest museum exhibition techniques and the extent of the collections in these areas. He was pleased to note that some of the institutions visited have inspired a renaissance of temporary craftsmanship in their regions.

In the summer of 1961 Miss Rodris C. Roth, associate curator of cultural history, visited many museums and historic houses in England, including some in Cambridge and Brighton, in addition to the better-known institutions in and near London. She studied collections specifically in relation to research projects and problems, and generally in relation to museum practices and attitudes.

In September and October Dr. Vladimir Clain-Stefanelli, curator of numismatics, and Mrs. Clain-Stefanelli, associated curator, visited numismatic collections housed in museums in Portugal, Spain, Italy, Austria, Germany, France, Sweden, and Denmark. They were much impressed by the excellence of many of these collections. The increase in interest in numismatics is noticeable all over the western world, as evidenced by the new exhibits observed in various stages of completion. The extensive series of numismatic exhibit halls in preparation in Madrid is a good example. These will provide the world's largest display of its kind and, together with the six planned exhibit

halls in the Catalan numismatic museum in Barcelona, will give Spain a leading position in this field so far as sheer exhibit area is concerned.

Donald E. Kloster, museum aide in the division of military history, visited several military museums in Oslo, Norway, and Copenhagen, Denmark, during July and August. He studied the display techniques, conservation measures and experiments, storage systems, and reference collections of each museum and obtained considerable information on experiments and practices in preservation, especially in the fields of leather, metal, and silk.

EXHIBITIONS

On June 28, 1962, the modernized hall of the cultures of the Pacific and Asia was formally opened in the presence of ambassadors and other official representatives of several Pacific and Southeast Asian countries. In this hall 50 special exhibit units depict aspects of past and present life in the Pacific Islands, Australia, New Zealand, and the great arc of southern Asia from the Philippines to Pakistan. The cultures represented range from the Stone Age to the highly advanced cultures of India, Pakistan, Malaya, and Indonesia. The peoples of Hawaii and New Zealand are portrayed as they existed when discovered by Europeans over a century ago. Included among the exhibits are a large stone head from Easter Island, a 6½-foot piece of stone money from Yap, royal feather capes from Hawaii, and recent gifts of material culture from India and Malaya. Life groups depicting living conditions of New Guinea pygmies, an Ifugao rice harvest in the Philippines, and domestic scenes among the Maori of New Zealand and the Samoans are installed in the hall.

Construction in the adjacent hall, which will contain additional Asian exhibits and also interpret the cultures of Africa, was nearing completion at the year's end.

At the close of the year two-thirds of the exhibits in the second of two halls of North American archeology had been designed and installation was proceeding in anticipation of a fall opening. This hall will display exhibits which will interpret archeological methods and objectives and the prehistoric cultures of the United States east of the Rocky Mountains.

Staff members of the department of anthropology collaborated with the division of cultural history in the selection of musical instruments from the Congo, Polynesia, China, and Thailand for an exhibit assembled for the Eighth Congress of the International Musicological Society which met in Washington. A selection of weapons and armor from the John Oliver La Gorce collection was displayed from November 1961 to March 1962. In December 1961 and January 1962 the division of ethnology offered a special exhibition, of 80 newly cleaned

and restored oil paintings of American Indians by the artist George Catlin, which was installed in the foyer of the Natural History Building.

By the year's end the major construction of the hall of fossil reptiles was completed and several wall displays were partially or completely installed by the staff of the division of vertebrate paleontology. This hall will interpret the biological relationships among the reptiles through time and the various ways in which they met environmental demands. J. H. Matternes completed the large mural depicting an early Miocene assemblage of terrestrial mammals.

Many new and outstanding gems, including a 300-carat blue star sapphire from Burma, were added to the gem exhibit. On November 9, 1961, the 245.35-carat Jubilee diamond, the third largest in existence, was received on loan from its owner, Paul-Louis Weiller, and placed on exhibition for approximately 8 months.

Curatorial activity in the development of the hall of oceanic life, including field collecting of specimens for exhibition, the specification of models, and the writing of detailed exhibits scripts, was coordinated by Dr. Fenner A. Chace, Jr., curator of marine invertebrates. Detailed specifications for models of marine invertebrates were prepared during the year for the guidance of highly skilled modelmakers.

Construction of the new hall of cold-blooded vertebrates began early in May 1962. Displayed in this hall when completed will be representative types of fishes, amphibians, and reptiles, and exhibits interpreting their life activities, anatomical adaptations, breeding behavior, distribution, and developmental history.

Planning of the exhibits for the new hall of osteology was advanced during the year. Skeletons of mammals, birds, fishes, reptiles, and amphibians have been carefully selected to illustrate relationships, variations, specializations, and adaptations. General topics, such as the nature of bones and the interrelationships of skeletal parts, also will be presented in this hall.

The temporary exhibit of mollusks in the west hall of the second floor was removed to provide space for construction activities in the adjacent exhibit hall.

Curatorial efforts in the department of science and technology were directed toward the acquisition of specimens, the specification of models to be built, and the writing of exhibits scripts. Exhibits for five halls to be installed in the new Museum of History and Technology Building were in production during the year. Twelve new exhibits on health education and the history of medicine, pharmacy, and dentistry were installed in the gallery of medical sciences in the Arts and Industries Building. They illustrate child health, the use of X-rays in medicine, hearing aids and surgery of the ear, inhalers,

masks and machines used in anesthesia, the development of electrocardiographs, early pharmaceutical mortars and pestles, and dental drilling.

A fine collection of original machine tools was obtained and a dozen models illustrating the development of tools for mass production were completed. One of the exhibits in the hall of tools will be a reproduction of a 13th-century stained-glass panel from the Cathedral of Chartres depicting a wood turner at work.

A special case was built to exhibit a reproduction of the DeDondi clock, the earliest known mechanical clock about which details have survived. This will be one of the featured exhibits in the hall of light machinery. Construction of a series of enlarged escapement models illustrating significant clock and watch mechanisms was in progress. Designs and specifications for a full-size operating tower clock, to be installed in the horology section of the light machinery hall, have been developed.

For the hall of civil engineering eight scale models illustrating the historic development of soft-ground and hard-rock tunneling in Europe and America were completed. In the refrigeration section of the hall of heavy machinery, a number of demonstrations of the principally employed refrigeration cycles will be featured with examples of refrigeration machinery. Exhibits interpreting early physical science were completed, and additional units in both classical and applied physics were prepared.

In December 1961, the 92-foot, 280-ton Pacific-type locomotive "1401," a gift of the Southern Railway System, was the first exhibit to be installed in the new Museum of History and Technology Building.

Three vehicles which will be exhibited in the hall of automobiles and coaches in the new museum were restored. The Lawrence coach, a gift of Mrs. Richard Saltonstall, was placed on display in the Arts and Industries Building in May 1962. The Winton Bullet and Haynes automobiles were restored and returned to exhibition in the hall.

During the year an Edison incandescent lamp collection, previously in storage, and a color television set, presented by the General Electric Research Laboratory, were placed on exhibition in the Arts and Industries Building.

A change in the mechanism of the automatic quilt case was necessitated by unexpectedly heavy use by visitors. The dial electronic system of operation was replaced by a much simpler direct mechanical means of selecting quilts. Temporary exhibits of large color photographs lent by the U.S. Soil Conservation Service were continued in the farm machinery hall.

The *Kelmscott Chaucer*, a beautiful and important book printed by

William Morris, was placed on permanent display in May 1962. Housed in a specially designed case, this book is a gift of Senator Clinton P. Anderson, a Regent of the Smithsonian Institution.

The appointment by the American Petroleum Institute of a special subcommittee to assist in the location of historical material and to develop appropriate exhibits has provided a valuable means of communication with the production side of the petroleum industry. A large number of typical machines have been acquired for the hall of general manufacturing.

The division of political history installed small temporary exhibits dealing with the political campaigns of 1840 and 1896, and an exhibition of commemorative objects associated with the three assassinated presidents. The Women's Rights exhibition is being developed gradually to reflect more completely and with greater accuracy the development of this movement in the United States during the 19th and 20th centuries.

An exceptional collection of marked 17th- and 18th-century American pewter lent by Dr. Joseph H. Kler, and a New York repoussé silver 2-handled bowl, made in the early 18th century by Benjamin Wynkoop for Nicholas and Hiletje Roosevelt and lent by Mrs. Jack R. Hovey, were placed on exhibition in the present hall of everyday life in early America in the Natural History Building.

A special exhibition of rare and seldom shown musical instruments was assembled from the museum collections on the occasion of the Eighth Congress of the International Musicological Society in September 1961. On view through October, this attractive display of instruments associated with the traditional music of Europe and America, as well as instruments from Asia, Africa, and Oceania, proved of interest to the public as well as to students of music.

The cooperation of the British Crown Agents enabled the Museum to prepare a special exhibition featuring new stamps issued by Seychelles, Fiji, Tanganyika, Swaziland, and the Postal Centenary issue for the West Indies. Also displayed were original drawings and design subjects for these stamps, items seldom seen outside the British Isles.

In the numismatics hall a specially designed semiautomatic case which can display an average of 800 coins was installed on an experimental basis. It contains 40 trays, each measuring 2.5″ x 44″, suspended between continuous chain devices. The visitor may select for viewing any tray in which he may be interested.

Highlight of the completely restored series of World War I naval vessels was a strikingly camouflaged model of the cruiser *St. Louis*. Prominent among new Civil War models were the Union gunboat *Carondelet*, the Confederate ironclad *Fredericksburg*, and the Con-

federate submarine *H. L. Hunley*. A full-scale replica of the Curtiss A–1, first aircraft purchased by the United States Navy, was placed on exhibition with the cooperation of the National Air Museum.

A special exhibition of marine paintings and ship portraits by John W. Schmidt was shown in the rotunda of the Arts and Industries Building during December 1961 and January 1962. The division of naval history also cooperated with the Naval Historical Foundation in providing half models and other memorabilia for exhibits, on naval aviation and naval aspects of the Civil War, held in the Truxton Decatur Museum. During the annual meeting of the Company of Military Collectors and Historians, a special display of rare naval uniforms and flags of the Civil War period was exhibited.

Under the chairmanship of museum director Albert C. Smith, the committee coordinating and supervising the modernization of natural-history exhibits reviewed the planning of six additional halls in earlier stages of development.

Assistant director John C. Ewers continued to coordinate the activities of the curators and the exhibits staff engaged in planning and preparing exhibits for the Museum of History and Technology. During the year exhibits units were prepared which will be installed in 16 halls of the new building. Although some of these exhibits were placed on temporary display in the Arts and Industries Building, others were placed in storage until the museum is completed.

Exhibits chief John E. Anglim provided over-all supervision to the exhibits staff engaged in the design, production, and installation of permanent exhibits in the U.S. National Museum, and directly supervised the exhibits laboratory in the Museum of Natural History. Benjamin W. Lawless continued to supervise the design and preparation of exhibits for the Museum of History and Technology, assisted by Robert Widder in design, Bela S. Bory in production, and Robert Klinger in the model shop. Julius Tretick assisted in supervising the production and installation of exhibits in the Natural History Building. Joseph G. Weiner, with the assistance of Constance Minkin and Edna Wright, continued the editing of the curators' drafts of exhibits scripts and labels.

The design of the renovated halls in the Natural History Building was aided greatly by Richard S. Johnson, design branch chief, and John E. Morrissey, architectural branch chief, of the architectural and structural division of the Public Buildings Service, General Services Administration, and by Luther H. Flouton and Pasquale Battestelli, design architects of that agency.

DOCENT SERVICE

The Junior League of Washington continued its volunteer docent program, conducting school classes from the greater Washington area

through the Smithsonian museums. The program was carried out through the cooperation of curator G. Carroll Lindsay, Smithsonian Museum Service, with Mrs. E. Tillman Stirling, chairman of the League's docent committee, and Mrs. Vernon Knight, cochairman. Mrs. Knight will serve as chairman for the forthcoming year, with Mrs. Dickson R. Loos as cochairman.

During the 1961–62 school year 20,880 children were conducted on 720 tours, representing a 24-percent increase over the previous year's participation.

Tours were conducted in the halls of everyday life in early America, Indians of the Americas, and textiles, for grades 3 through 6, and in the halls of gems and minerals and power machinery, for grade 5 through junior high school. Four tours each day, 5 days a week, were offered every half hour from 10 through 11:30 a.m. in the halls of everyday life in early America and in Indians of the Americas. Tours in the hall of gems and minerals were conducted on Monday through Friday at 10 and 11 a.m. To meet the increasing demand for docent service in this hall, tours were occasionally offered at noon and at 1 p.m., in addition to the tours offered in the morning. Two tours daily during school days were offered in the power machinery and textile halls.

Tours were conducted from October 16, 1961, through May 25, 1962, with the exception of the month of April 1962, when tours were suspended because of the exceedingly heavy visitor traffic in all museum halls during the Easter and cherry-blossom seasons. The great number of visitors to the Smithsonian museums during the early spring so overcrowd the exhibition halls that the usual group tours cannot be satisfactorily conducted.

In addition to Mrs. Stirling and Mrs. Knight, the members of the League's docent committee were: Mrs. George Armstrong, Mrs. A. Stuart Baldwin, Miss Janet W. Barfield, Mrs. Thad H. Brown, Jr., Mrs. Thomas R. Cate, Mrs. Thomas K. Clarke, Mrs. Dean B. Cowie, Mrs. William Dixon, Mrs. Rockwood Foster, Mrs. Clark Gearhart, Mrs. George Gerber, Mrs. Robert H. Harwood, Mrs. Everett Hutchinson, Mrs. Charles J. Kelly, Jr., Mrs. J. H. Lasley, Mrs. Ralph W. Lee III, Mrs. Dickson R. Loos, Mrs. John Manfuso, Jr., Mrs. Ernest May, Mrs. William McClure, Mrs. Robert McCormick, Mrs. Arnold B. McKinnon, Mrs. Peter Macdonald, Mrs. Joseph Metcalf, Mrs. William Minshall, Jr., Mrs. L. Edgar Prina, Mrs. Robert E. Rogers, Mrs. W. James Sears, Mrs. Walter Slowinski, Mrs. Joseph Smith, Jr., Mrs. James H. Stallings, Jr., Mrs. David Toll, Mrs. John S. Voorhees, Mrs. Richard Wallis, and Mrs. Marc A. White.

The Institution deeply appreciates the able and devoted efforts of these volunteers, whose services to the schools of the Washington area

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encourage effective use of Smithsonian museum exhibits by teacher and student alike.

BUILDINGS AND EQUIPMENT

At the close of the fiscal year the contract for construction of the west wing and completion of renovation of the existing Natural History Building of the Smithsonian Institution had not been awarded. The west wing when completed will provide laboratories and workrooms as well as more adequate storage space for collections of the entire department of botany and the divisions of fishes, reptiles and amphibians, marine invertebrates, and insects. On June 26, 1962, construction of the east wing, which was started on January 3, 1961, was about 85 percent complete.

During the year construction of the building for the Museum of History and Technology reached the stage where it was deemed advisable to place two of the largest museum objects in the exhibition galleries. The large steam locomotive and tender presented by the Southern Railway System was placed on the rails in the first-floor transportation hall, and the original Revolutionary War gunboat *Philadelphia* was hoisted through a window to its display place in a third-floor military history hall. The Public Buildings Service, General Services Administration, advises that limited areas in the building should be available for occupancy commencing in October 1962, and that substantial occupancy of the entire building is estimated to be possible in March 1963. At the end of the fiscal year the construction of the building had reached 81 percent of completion.

CHANGES IN ORGANIZATION AND STAFF

In the department of zoology, Dr. Horton H. Hobbs, Jr., accepted appointment as head curator on February 1, 1962. Dr. Donald R. Davis, specialist in microlepidopteran moths, was appointed associate curator September 14, 1961, in the division of insects. A vacancy in the division of mollusks was filled October 2, 1961, by the appointment of Dr. Joseph Rosewater as associate curator. Dr. Donald F. Squires, a stony-coral specialist, entered on duty as associate curator in the division of marine invertebrates on December 18, 1961. Dr. Philip S. Humphrey was appointed curator of birds on June 1, 1962. Dr. William H. Crocker was appointed associate curator in ethnology February 12, 1962, to provide coverage of South American aboriginal material culture.

Included among the additions to the staff of the Museum of History and Technology were the appointments of Dr. Lester Clark Lewis as curator of physical sciences on February 19, 1962, and Dr. Walter F. Cannon as associate curator on February 5, 1962. In the division of

mechanical and civil engineering Silvio A. Bedini accepted an appointment of curator in charge of the section of tools on November 27, 1961. Joseph Rudmann entered on duty October 30, 1961, as assistant curator in the head curator's office, department of science and technology. Miss Doris Ann Esch entered on duty June 13, 1961, as assistant curator, and Miss Ellen Joy Finnegan as junior curator August 7, 1961, in the head curator's office, department of civil history. Keith E. Melder was appointed assistant curator of political history on September 5, 1961. In the department of armed forces history, Dr. Melvin H. Jackson entered on duty as assistant curator September 14, 1961.

Herbert G. Deignan, curator of birds, resigned January 31, 1962, after 24 years of service in the U.S. National Museum. Mr. Deignan intends to reside in Geneva, Switzerland, but plans to engage in Madagascar field ornithological studies as a member of a Museum expedition.

Dr. Frederick M. Bayer, associate curator of soft corals, division of marine invertebrates, for the past 14 years, resigned December 15, 1961, to accept the position of research associate professor, Institute of Marine Science, University of Miami, Florida.

Robert R. Ireland, Jr., assistant curator of cryptogams, resigned on December 12, 1961, to continue with graduate studies after 4 years' service in the department of botany.

On January 31, 1962, Emery C. Leonard retired as associate curator of phanerogams after 44 years' service in the department of botany. Mr. Leonard's employment by the Institution began on January 2, 1918.

Dr. Ray S. Bassler, research associate in geology since his retirement, died at Washington, D.C., on October 3, 1961. Dr. Bassler retired as head curator of the department of geology on July 31, 1948, after 47 years' service. Dr. David C. Graham, a collaborator in biology since October 19, 1931, died at Englewood, Colo., on September 15, 1961. Dr. Graham served as a missionary in Szechwan and other parts of China for many years and during this service forwarded important natural-history collections to the U.S. National Museum. A. Brazier Howell, a collaborator in mammalogy since December 11, 1926, and formerly a member of the staff of the department of anatomy of Johns Hopkins University, died at Bangor, Maine, on December 23, 1961. Dr. Roland W. Brown, a collaborator in paleobotany since December 27, 1956, died at Lehighton, Pa., on December 12, 1961.

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, 1962, 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, devoted a portion of his time to office duties and the general supervision of the Bureau and the River Basin Surveys. In mid-July in company with Dr. Robert L. Stephenson, chief of the Missouri Basin Project of the River Basin Surveys, and Dr. John M. Corbett, archeologist for the National Park Service, he made an inspection trip to the River Basin Surveys excavating parties in the Missouri Basin and visited several local institutions which were conducting excavations in cooperation with the Inter-Agency Archeological Salvage Program. He then proceeded to the Agate Basin Site in eastern Wyoming where a joint Smithsonian Institution-National Geographic Society party under his general direction was digging in a site attributable to one of the early hunting groups in the Plains area. Dr. Roberts remained at the site until the work was terminated early in August. The immediate field work was under the direction of Dr. William M. Bass. During the course of the investigations numerous cut and split animal bones with evidence both for a kill and for a camping area were found. Associated with them were a variety of stone and bone implements. Most of the animal bones have been identified as representing bison of an extinct species, *Bison antiquus*. A few of the bones undoubtedly represent one of the Cervidae, but they are not diagnostic of species. Also, there were a few jack-rabbit bones. The artifacts in addition to projectile points include various forms of scrapers, flake knives, spoke shaves, flakes with graver's points, and a few bone tools. This assemblage of implements represents a definite contribution because it makes

possible the establishment of an Agate Basin Complex. At two places in the excavated area, objects found at a lower level indicated that Folsom Man had at least visited the area prior to the occupation by the makers of the Agate Basin type complex. One carbon-14 date obtained for the Agate Basin level indicates that the occupation was at about 9,350±400 years before the present, and charcoal from the Folsom level has given a date of 10,375±700 years before the present. This suggests that the basin was occupied at least at intervals over a period of about 1,000 years.

After returning to Washington from Wyoming, Dr. Roberts went to São Paulo, Brazil, where he represented the Smithsonian Institution and the United States at a conference on the origin and antiquity of man in the New World. He made three speeches at the conference and was elected one of the two vice presidents for the session. In September he went to Mesa Verde National Park in southwestern Colorado where he served as a member of the advisory group for the Wetherill Mesa Project. In November he participated in the 19th Plains Conference for Archeology at Lawton, Okla., and read a paper on the 1961 excavations at the Agate Basin Site. Later he went to Macon, Ga., as a member of an advisory group for a series of studies to be carried on at Ocmulgee National Monument. Early in June he visited the offices of the Missouri Basin Project of the River Basin Survey at Lincoln, Nebr., and assisted in sending out a number of field parties for work in Kansas, South Dakota, Wyoming, and Montana.

Dr. Henry B. Collins, anthropologist, continued his Eskimo studies and other Arctic activities. The Russian translation program—*Anthropology of the North: Translations from Russian Sources*—which he organized in 1960 continued its operation with the support of a second year's grant from the National Science Foundation. The second volume of translations, *Studies in Siberian Ethnogenesis*, edited by Henry N. Michael, was published by the University of Toronto Press for the Arctic Institute of North America in April 1962. This 313-page volume contains 17 articles by Soviet ethnologists, anthropologists, historians, and linguists on the origin and relationships of the Yakut, Tungus, Buryat, Kirgiz, the Amur tribes, and Samoyed and other ethnic groups of Siberia. Work is proceeding on the translation and editing of additional volumes and papers on Siberian archeology, ethnology, and physical anthropology selected by the Arctic Institute's advisory committee, of which Dr. Collins is chairman.

Dr. Collins' article on Eskimo art appeared in volume 5 of the *Encyclopaedia of World Art*. It traces the development of Eskimo art from prehistoric to modern times and describes and illustrates the

various regional art styles, ancient and modern, in Alaska, Canada, and Greenland. He also prepared an article on the relationships of the earliest Eskimo cultures to recently discovered pre-Eskimo cultures in the western Arctic for a volume on early man in the western Arctic to be published by the University of Alaska.

Dr. Collins continued to serve as a member of the Board of Governors of the Arctic Institute of North America and as a member of its publications committee responsible for the quarterly journal *Arctic* and the two other Arctic Institute series, *Technical Papers* and *Special Publications*. He also continued to serve as chairman of the directing committee which plans and supervises preparation of the *Arctic Bibliography*, a comprehensive reference work which abstracts and indexes the contents of publications in all fields of science, and in all languages, relating to the Arctic and sub-Arctic regions of the world. This Arctic Institute project, for which Dr. Collins has been primarily responsible since its inception in 1947, is being supported by grants and allotments from the Department of Defense, National Institutes of Health, Atomic Energy Commission, and Defense Research Board of Canada. The Library of Congress provides office space, and most of the work of compilation and editing is done there under the direction of Miss Marie Tremaine. In addition to the unsurpassed collections of the Library of Congress, those of the Smithsonian Library and 80 other large libraries in the United States and Canada, as well as of polar research institutes in England, France, and Norway, are being utilized in the preparation of the bibliography. Volume 10 was issued by the Government Printing Office in December 1961, and volume 11 is ready for the printer. Volume 10 (1,520 pages) abstracts and indexes the contents of 6,570 scientific publications on Arctic and sub-Arctic areas and on low temperature conditions; added to the abstracts appearing in the previous nine volumes, this makes a total of 62,848 such publications abstracted to date. In volume 10, for the first time, Russian language material exceeds that in English, reflecting expanded research activities of Soviet scientists in their Arctic territories; the volume contains abstracts, all in English, of 3,075 Russian publications, of 2,503 publications in English, 513 Scandinavian, 212 German, and 267 in other languages. Subjects that have received special emphasis in this volume are geology, geophysics, mineral resources, meteorology, fisheries, oceanography, transportation, construction, economic and social conditions, anthropology and acculturation of Eskimos and native Siberian peoples, acclimatization, military and public health, diseases, and the environmental effects of darkness, humidity, light, and low temperature on animals, man, and plants.

Dr. William C. Sturtevant, ethnologist, continued his research re-

lated to the ethnology of the Eastern North American Indians. Particularly he broadened his Iroquois research, previously concentrated on the Seneca of New York, to include the very poorly known Seneca-Cayuga of northeastern Oklahoma. During August 1961 he spent 3 weeks doing field work among this group (including attendance at their major annual ceremony, the Green Corn Dance). In January and May he spent several days studying Oklahoma Seneca-Cayuga specimens in the Museum of the American Indian in New York, and in June visited the National Museum of Canada in Ottawa to study the large collection made among this group by Marius Barbeau in 1911 and 1912. These Iroquois are descended from a group which settled in Ohio in the 18th century, together with accretions received since then from New York and Canada. At present those who speak an Indian language speak Cayuga. Although there have been continuous intermittent contacts with other Iroquois, the culture of this group is the most deviant found in any Iroquois community, and its study promises to elucidate several aspects of general Iroquois culture—particularly some features of the various major ritual complexes. Conversations with informants during a brief return visit to the New York Seneca in October helped clarify some of these matters.

While in Oklahoma Dr. Sturtevant spent a day among the Delaware inquiring about the last years of their ceremonial structure, the Big House. Carved posts from this building were studied in museums in Oklahoma, New York, and Toronto during this and previous years, and some notes on the subject by F. G. Speck were located in the American Philosophical Society Library in Philadelphia. Dr. Sturtevant returned from Oklahoma via Mississippi and North Carolina, stopping about 3 days in each State to renew and expand his acquaintance with the Choctaw and Cherokee.

During September Dr. Sturtevant prepared a paper on "Spanish-Indian Relations in Southeastern North America," which he delivered at the annual meeting of the American Indian Ethnohistoric Conference in Providence in October. This later appeared in *Ethnohistory* (vol. 9, pp. 41–94, 1962). His paper on "Taino Agriculture" was published in *Antropológica Supplement Publication No. 2* (Caracas, 1961). In October Dr. Sturtevant attended an International Conference on Iroquois Research, at McMaster University, Hamilton, Ontario, where he presented an oral report on his Oklahoma field work. In November he attended the annual meetings of the American Anthropological Association in Philadelphia.

Dr. Wallace L. Chafe, linguist, spent July and August in Anadarko, Okla., collecting material for a description of the Caddo language. He recorded a considerable quantity of linguistic data on this language for which almost no information was previously available, and he

returned to Oklahoma in mid-June 1962 to continue this work. In August he spent a few days with Dr. Sturtevant at the Seneca-Cayuga Green Corn Dance and was able to locate a few speakers of Wyandot, a language that had been thought to be extinct.

Between September and May Dr. Chafe worked at the Bureau on a half-time basis, teaching courses on several linguistic subjects at Catholic and Georgetown Universities. At Georgetown he worked with a speaker of Winnebago and hopes eventually to prepare some descriptive material on that language. Through this study he was led to pursue further some facts suggestive of a remote relationship between the Siouan, Caddoan, and Iroquoian language families. During the fall he continued his survey of the present number of speakers of North American Indian languages, the results of which are being published in the *International Journal of American Linguistics*. He read papers at the International Conference on Iroquoian Studies at Hamilton, Ontario, in October, and at the Annual Meeting of the American Anthropological Association in Philadelphia in November. He was program chairman for the spring meeting of the American Ethnological Society in Washington in April and edited the papers read at the meeting for publication. During the late spring he spent several weeks continuing work on a Seneca dictionary.

Robert M. Laughlin, ethnologist specializing in the Middle American area, joined the staff of the Bureau on June 11, 1962. He spent the remaining days of the fiscal year in research on the Huastec of Veracruz and San Luis Potosí, Mexico, in preparation for an article for the Handbook of Middle American Indians, to be published by the Middle American Research Institute of Tulane University.

RIVER BASIN SURVEYS

During fiscal 1962 the River Basin Surveys unit continued its program for salvage archeology in areas to be flooded or otherwise destroyed by the construction of large dams. The work as in previous years was carried on in cooperation with the National Park Service and the Bureau of Reclamation of the Department of the Interior, the Corps of Engineers of the Department of the Army, and a number of State and local institutions. An increase in funds that became available late in the year made possible an expansion in the program. During 1961–62 the investigations were supported by a transfer of $231,705 from the National Park Service and a grant of $2,000 from the Appalachian Power Co. The funds from the National Park Service were for use in the Missouri Basin and along the Chattahoochee River, Alabama-Georgia. The grant from the Appalachian Power Co. was to provide for an archeological survey in the area along

the Roanoke River in southern Virginia where its Smith Mountain Project is underway. The funds from the National Park Service provided $204,500 for the Missouri Basin and $27,205 for the Chattahoochee Project. A carryover of $7,734 in the Missouri Basin made the total for that area $212,234. The grand total of funds available in 1961–62 for the River Basin Surveys was $241,439.

Investigations in the field consisted of surveys and excavations. Most of the efforts were concentrated in the digging of sites, but surveys were made in three new reservoir basins and two watershed project areas. Also, at the end of the year a survey was underway in the Missouri River area in Montana, locally known as the Missouri Breaks, which is to be set aside as the Lewis and Clark National Wilderness Waterway. Two of the new reservoirs were in Virginia and one in Nebraska. One of the watershed projects was also in Nebraska and the other was in Iowa. At the beginning of the fiscal year three parties were in the field in the Missouri Basin. A fourth began operations in that area in August, and another party resumed investigations along the Chattahoochee River during the same period. At the end of April a party returned to the Chattahoochee area and started further excavations in the Walter F. George Reservoir Basin. In May two small parties were at work in Nebraska, one in South Dakota, and one in Iowa. In June 11 parties moved into the Missouri Basin; one of them was working in Kansas, seven were in South Dakota, one was in Wyoming, one was in Wyoming-Montana, and one in Montana. With the exception of the one in Alabama-Georgia, which terminated its activities on June 30, all these parties were continuing their investigations at the close of the fiscal year.

As of June 30, 1962, reservoir areas where archeological surveys and excavations had been made since the start of the salvage program totaled 258, located in 29 States. In addition, two lock projects, four canal areas, and two watershed areas had been examined. During the years since the program got underway, 4,979 sites have been located and recorded, and of that number 1,171 were recommended for excavation or limited testing. Because complete excavation is rarely possible, except in the case of a few small sites, the term "excavation" implies digging approximately 10 percent of a site. With the exception of those where the work was done during the past year, preliminary appraisal reports have been issued for most of the areas surveyed and, in cases where additional reconnaissance has resulted in the discovery of other sites, supplemental reports have been prepared. Where no archeological manifestations were noted or where they were too meager to be of import, no general report was issued. Manuscripts have been completed for two of the surveys made last year, and they probably will be issued sometime during the coming fiscal year.

By the end of the year, 547 sites in 54 reservoir basins and 1 watershed area had either been tested or dug sufficiently to provide good information about them. Thus far at least one example of each site recorded in the preliminary surveys has been examined. They cover the range from camping locations occupied by the early hunting and gathering peoples of about 10,000 years ago to village remains left by early historic Indians, as well as the remains of frontier Army and trading posts of European origin. Reports on the results of the investigations have appeared in various scientific journals, in the Bulletins of the Bureau of American Ethnology, and in the Miscellaneous Collections of the Smithsonian Institution. Bulletin 179, containing River Basin Surveys Papers 21–24, was distributed in December 1961. These papers consist of a series of reports on excavations conducted in Texas, Iowa, and the Columbia basin, Oregon-Washington. Bulletin 182, containing River Basin Surveys Paper 25, a report on the excavations carried on in the John H. Kerr Reservoir basin, Virginia-North Carolina, was in press at the end of the year and should be ready for distribution early in the coming year. River Basin Surveys Papers 26–32, comprising Bulletin 185, should be ready for distribution early in the coming year. The papers contain data on the results of investigations in the Tiber Reservoir basin, Montana, the Garrison and Jamestown Reservoir areas in North Dakota, and the Lovewell Reservoir area in Kansas. River Basin Surveys Papers 33–38, which will constitute Bulletin 189, have been turned over to the editors and will be sent to the printer early in the next fiscal year. The contents pertain to excavations in North Dakota, South Dakota, and Kansas.

Throughout the year the River Basin Surveys continued to receive helpful cooperation from the National Park Service, the Bureau of Reclamation, the Corps of Engineers, the Geological Survey, and various State and local institutions. The field personnel of all the cooperating agencies assisted the party leaders in many ways and the relationship was excellent in all areas. Transportation and guides were furnished in a number of instances, and mechanical equipment made available by the construction agency speeded the work at a number of locations. Detailed maps of the reservoirs under investigation were supplied by the agency concerned and helpful information was provided whenever it was needed. The National Park Service continued to serve as liaison between the various agencies, both in Washington and in the field. It also was responsible for the preparation of estimates and justifications for the funds needed to carry out the salvage program. Valuable assistance in numerous ways was provided by the commanding officer at Fort Benning in Georgia while studies were being made in that portion of the Walter F. George

Reservoir basin which is within the boundaries of the Fort Benning Reservation. Various local clubs and groups of citizens, both in Alabama and Georgia, the Georgia Historical Commission, and the University of Georgia assisted the leader of the River Basin Surveys party while he was working along the Chattahoochee River. In the Missouri Basin Project engineers and personnel from the Corps of Engineers were very helpful in carrying out activities in that area. Furthermore, the Corps of Engineers and the Missouri Basin Project of the River Basin Surveys cooperated in the preparation of small informative pamphlets telling about various reservoirs along the Missouri River. The pamphlets were published by the Corps of Engineers and are being distributed to visitors at various reservoir installations.

General direction and supervision of the program were continued by the main office in Washington. The field headquarters and laboratory at Lincoln, Nebr., was in direct charge of the work in the Missouri Basin. The activities along the Chattahoochee River and in southern Virginia were supervised by the Washington office.

Washington office.—The main headquarters of the River Basin Surveys in the Bureau of American Ethnology continued under the direction of Dr. Frank H. H. Roberts, Jr., throughout the year. Carl F. Miller and Harold A. Huscher, archeologists, were based at that office. Mr. Miller spent a major portion of the year in the Washington office working on materials and data he had collected during previous seasons in the field. He also corrected the final page proofs for his report on the investigations made at the James H. Kerr Reservoir on the Roanoke River in southern Virginia. He made a number of talks before schools and civic organizations in the metropolitan area of Washington and spoke before the Archeological Society of Delaware at Wilmington. In October he attended the sessions of the Eastern States Archeological Federation at Williamsburg, Va. He identified numerous artifacts from the southeastern archeological area for collectors who either sent them to the office or brought them in person and furnished information for replies to letters inquiring about archeological problems. On April 3 at Rocky Mount, Va., he began an archeological reconnaissance of the Smith Mountain Project of the Appalachian Power Co. He completed that assignment and returned to Washington on May 11. He then prepared a report on the results of his survey, recommending a series of excavations for the two reservoir areas included in the project. On June 11 he left Washington for Lincoln, Nebr., to take charge of one of the Missouri Basin field parties. His activities during the remainder of the fiscal year are covered in the Missouri Basin portion of this report.

At the beginning of the fiscal year Mr. Huscher was in the Washing-

ton office working on records and collections from the previous field season. Early in August he established headquarters at Eufaula, Ala., for a series of archeological studies in the Walter F. George Reservoir basin on the Chattahoochee River. Because of unfavorable weather conditions, he ended his field activities there at the end of December. In November he participated in the sessions of the Conference for Plains Archeology, at Lawton, Okla., and on December 1 and 2 in the Southeastern Archeological Conference held at Ocmulgee National Monument at Macon, Ga. After his return to Washington, Mr. Huscher devoted his time to the study of data and materials which he had collected during the previous months along the Chattahoochee River. At the end of May he again returned to the Walter F. George Reservoir area, Alabama-Georgia, and resumed his investigations of archeological sites to be flooded by the rising waters of the reservoir. He completed his field activities at the end of June.

Alabama-Georgia.—During the period from August 4 to December 30, a series of investigations was made in the Walter F. George Reservoir basin on the Chattahoochee River by a party under the direction of Harold A. Huscher. They spent the first 2 weeks of the field season checking a series of public-use areas laid out at regular intervals on both sides of the Chattahoochee River from Columbia, Ala., north to the Fort Benning area. Between the Fort Benning Reservation and Columbus, Ga., a series of harbor developments is contemplated, and a further check of sites was made at that location. The party found that the recreation-area program would involve four important sites on the Alabama side of the river and one on the Georgia side. Original plans had called for virtual destruction of the great Rood's Landing mound site on the Georgia side, but as a result of conferences with the representatives of the Corps of Engineers the roads contemplated were shifted so that they would completely miss the mounds and adjacent archeological manifestations. The new plans also provided for the development of the central plaza of the site as a grassed lawn area. This particular site is significant because it was an important ceremonial center which contained eight mounds.

Following the study of the public-use area the crew was enlarged and the remainder of the field season was devoted to an examination of 24 additional sites. Collections were made from 21 of them, 9 of which had not previously been listed. Actual excavations were made at eight sites, of which the two mounds south of Georgetown, Ga., were worked most extensively. In every place where digging was done, four or more squares were excavated. Each square is 10′ x 10′ in area and each was excavated in 6″ levels, the material from them being put through power screens. This made possible

much more progress than would have been the case had the usual hand methods been used throughout.

The mound sites were particularly important because they contained considerable new information pertaining to several cultural periods in the region. One of them, known as the Cool Branch Mound site, proved to be an unusually fine example of a large burial mound with accompanying village, surrounded by a palisade. The large mound was in the approximate center and the walls were constructed to conform to its orientation. The enclosure was rectilinear, measuring about 700 feet on the side, with 10-foot-square bastions or towers spaced about 115 feet apart. The data obtained indicate that this village conformed quite closely to those which occupied the Gordon sites in Tennessee, the New Madrid sites, Aztalan in Wisconsin, and even the Huff and Black Partizan sites in the middle Missouri Valley. Furthermore, the findings agree closely with the description of the town of Mauvila in Alabama which the Spaniards destroyed in 1540. The village may well have been occupied at the time of the first penetration of the Spaniards, but it apparently was abandoned and fell into ruin before the Indians had contact with the Europeans, because no materials of European manufacture were recovered during the course of the excavations. The other locations consisted in the main of former villages, and they yielded specimens representative of all the cultural periods from Early Archaic to Early Historic Creek. The data obtained from them will assist materially in developing the aboriginal history of that area.

In the last week in April Mr. Huscher resumed his activities in the Walter F. George area. During most of May he continued further excavations at the Cool Branch site, gathering data on the burial pit which lay beneath the main mound and further information about the palisade walls and general village features. Attention was then turned to an examination of nine sites, one of which had not previously been recorded. Actual excavations were conducted at six of the sites. In view of the limited time available, only three excavation squares were dug at most of them, although in one or two cases an additional square was opened. Two of the sites have particular significance. One of them on the Alabama side of the river in the Fort Benning area is presumed to be the location of the last town occupied by the Yuchi in that area. It has not definitely been identified as to name, but the information from it should help to throw considerable light on the length of time that tribe was living that far north along the Chattahoochee River after having been driven from their Tennessee and Savannah River locations. The second site is on the opposite side of the river in Georgia and may well represent an extension or continuation of the Yuchi village in Alabama.

Trade materials are present in the deposits at both locations. Those on the Georgia side, however, are much less numerous than those on the Alabama side and may indicate an earlier abandonment of that part of the village. There is close similarity between the specimens from both sites. The Georgia site actually may represent the location of one of the towns called Hlekatchka and also seems to be the most promising location for the original Captain Ellich's (Yuchi) town which was settled in the early 18th century. If it was Hlekatchka, the latter is reported to have been destroyed in 1814. Excavations on the site produced large quantities of debris indicating the burning of a house or houses, possibly the entire village, which supports the idea that it may have been that particular village. It is unfortunate that time and funds did not permit further and more extensive excavations on both sides of the river. The other sites which were tested during June contributed still more information pertaining to several aboriginal periods in the Chattahoochee Valley.

Missouri Basin.—For the sixteenth 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, analyses of materials, and reporting on results. During the summer months the work consisted mainly of excavations. Analyses and preparation of reports received the major attention throughout the rest of the year. The chronology program, begun in January 1958, was especially emphasized.

At the beginning of the fiscal year the permanent staff, in addition to the chief, consisted of three archeologists, one administrative assistant, one administrative clerk, one secretary, one scientific illustrator, one photographer, and four museum aides. On the temporary staff were two assistant archeologists, one cook, and 25 field crewmen. At the end of the year there were five archeologists in addition to the chief, one administrative assistant, one administrative clerk, one secretary, one clerk typist, one scientific illustrator, one photographer, and four museum aides on the permanent staff. The temporary staff included 4 archeologists, 5 field assistants, 3 cooks, and 83 field crewmen.

During the year there were 19 Smithsonian River Basin Surveys field parties at work in the Missouri Basin. Two of these were operating in the Oahe Reservoir area and two in the Big Bend Reservoir area of South Dakota during July and August. One small party investigated the Salt-Wahoo Watershed area in Nebraska in April; one party conducted surveys and excavations in the Pony Creek Watershed area in Iowa in May; a small party visited the Fort Sully Site in the Oahe Reservoir area in May; a survey of the

Arcadia Reservoir area in Nebraska was also made in May; during June one party was at work in the Tuttle Creek Reservoir area in Kansas, one in the Missouri Breaks area of Montana, two in the Yellowtail Reservoir area of Montana and Wyoming, four in the Oahe Reservoir area of South Dakota, and three in the Big Bend Reservoir area of South Dakota.

Other field work in the Missouri Basin included 12 parties from State institutions operating under agreements with the National Park Service and in cooperation with the Smithsonian Institution in the Inter-Agency Archeological Salvage Program.

Appropriated funds for this fiscal year were materially increased over the previous 2 years, thus permitting a substantial increase in the amount of salvage that could be accomplished. Most of this new activity came at the end of the fiscal year since the field season at the beginning was nearly completed before the new money became available. The field parties at work at the start of the year were conducting intensive excavations of key sites. Toward the end of the year, when the 1962 field season began, crews were engaged in intensive surveys of new areas, sampling of large numbers of sites in other areas, and carrying on intensive excavations at a series of key sites in several reservoir basins.

At the beginning of the year Robert W. Neuman, assisted by William G. Buckles, was directing a crew of 10 Indian laborers excavating a series of 8 prehistoric burial mounds near the Big Bend Dam in central South Dakota. Having begun work on June 7 of the previous fiscal year, this party continued in the field until September 8. Three low, dome-shaped, earthen mounds were excavated at the Sitting Crow site (39BF225).[1] The mounds, ranging from 2 feet in height and 50 feet in diameter to nearly twice that size, contained 10 intrusive historic interments representing at least 3 types of burials. These were primary burials in wooden coffins, primary burials in pits, and a secondary bundle burial. Some of the coffin burials were associated with grave posts and were scattered, singly, while others were associated with the pit burials within a circular enclosure of vertical posts. Glass, metal, wood, stone, leather, and fabric grave goods were recovered from this historic component. The burial mound complex proper was represented by single and multiple secondary burials. These remains were found scattered about on the mound floor or sometimes deposited in shallow, sub-

[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.

mound pits. Artifact associations consist of small, triangular, side-notched points, end scrapers, marine and fresh-water shell beads, and a bipointed copper awl.

Four mounds were excavated at the Side Hill site (39BF223). The burial mound component there was essentially the same as at the Sitting Crow site, but in addition there was evidence of cremation in association with Truman Plain Rim pottery.

Only one mound was excavated at the Old Quarry site (39BF234). It was found to contain a portion of a wooden log, a bison skull, and concentrations of hematite on the mound floor. Two large, subfloor pits were located near the mound center and each contained secondary burials of seven to nine individuals. A single artifact, a large undiagnostic body sherd, was recovered from one pit. A bison skull also was found in the same pit.

While testing below the mounds at the Sitting Crow and Side Hill sites, two, and possibly three, stratified, lithic components were located. The deepest component was indicated by a zone of charcoal-stained soil containing stone chips. The intermediate component was in a light-colored soil zone and contained thin, triangular points with concave bases, end scrapers, knives, worked and unworked chips, bison bone fragments, and shallow basin-shaped firepits. The uppermost lithic component is typologically similar to the McKean complex represented at various sites in western South Dakota and eastern Wyoming.

During the last week of the field season, all the 46 mounds between Fort Thompson and Campbell Creek were mapped. They range from 25 to 80 feet in diameter and from 1 to 4 feet in height. The tumuli sometimes occur singly and in other instances are in groups.

The second Smithsonian Institution field party at work at the beginning of the year was directed by Dr. Warren W. Caldwell, assisted by Richard E. Jensen. With a crew of 11 men, they had begun work on June 13 of the preceding year and continued through August 22. The entire time was devoted to excavations at the Pretty Head site (39LM232). This site is situated on the right bank of the Missouri River in the lower portion of the Big Bend Reservoir area. Two houses were completely excavated, a third was excavated except for the heavy fill marking one corner, two midden areas were extensively tested, a defensive moat was sectioned in several places, and the old occupation surface between two houses was cleared.

The site is roughly a rectangular area of hillocks and depressions capping the riverward edge of Terrace 1, which stands about 60 feet above the summer stage of the Missouri River. A number of oval depressions were arranged in irregular rows paralleling the cutbank of the river. These proved to be the remains of houses, although

1. Smithsonian River Basin Surveys crew excavating two burial pits at the Old Quarry Mound, Big Bend Reservoir, South Dakota. These pits contained bones of both infants and adults.

2. Smithsonian River Basin Surveys crew skimming the floor of a long, rectangular house following dragline pass at the Pretty Head site, Big Bend Reservoir. The dragline was found very effective in moving large amounts of overburden.

1. Long, rectangular house excavated at the Pretty Head site. Crewman is sitting in the remnant of a ditch that extended the length of the house. The floor of the house, except where disturbed by the ditch, was covered with a deposit of red ocher. River Basin Surveys.

2. Aerial view of the Potts Village, Oahe Reservoir, South Dakota. The Missouri River is in the background. At maximum pool elevation the Oahe Reservoir will be about 15 feet above this site. The excavations outlined in the fortified area indicate the house structure within it. River Basin Surveys.

the orientation was not consistent and the village pattern was by no means as regular as had been anticipated. The village had only one extended occupation. It appears that the houses had been arranged in streets or blocks but subsequent growth was haphazard and unplanned. There is further support of this view in relation to the defensive features of the village. The entire occupation area is mantled by midden debris and wind-blown silts to such an extent that the moat was completely obscured. At least one late house (Feature 7) was built athwart the moat, which was already filled with refuse and could have had but little usefulness for defensive purposes. Feature 7 was smaller and less complex than the other houses.

Mantling all the houses were several soil zones, the earliest of which was particularly evident. It is tempting to equate this with a severe drought in the Central Plains during the last quarter of the 13th century. Drought conditions may well have been a disruptive factor that brought progressive changes and collapse to this village. The houses excavated (Features 2, 4, and 7) were uniformly of the long rectangular type but differed in details. All were deep, with floors excavated 2 to 3 feet below the old occupation surface, which in turn was 2 to 4 feet below the present surface. In each the floor had been painted with a red, mineral paint and in Feature 4 there were two such painted floors separated by 0.2 foot of sterile fill. The entrance to each house was a wide ramp from the old surface to the floor. In Feature 4, the ramp led across a wide platform and ended in a low step. On either side of the ramp was a narrow trench that continued across the front of the trench, separating it from the house proper. There was a similar trench in Feature 2.

A large number of bell-shaped cache pits were found beneath the floor of Feature 2, but not in the other houses. Features 2 and 4 contained much bison bone, particularly skulls, lying on the floor and within the mantling fill. They were notably absent from Feature 7, suggesting a change in cultural emphasis or perhaps in local ecology. In each house the firepit was located on the centerline just inside the inner end of the ramp. Superstructures of all three houses were nearly identical. Posts 2 or 3 feet apart were set at the base of the wall excavation and, except for the entrance, continued around the entire perimeter. Central posts were absent but were replaced by roof supports in two rows, each a short distance from the centerline.

A large area between Features 2 and 4 was cleared to the old surface and two thick midden deposits were trenched. The defensive moat was located and sectioned in six places, tracing it through Feature 7 and around a bastioned corner. Uniformly the moat was 3 to 5 feet deep with a maximum width of 10 feet. The accompanying stockade was not discernible. Artifacts were abundant in the midden

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areas and the house fill. Pottery was mainly of the Foreman types, but there was also much Over Focus pottery. Probably the cultural position of the site is intermediate between the Monroe-Anderson Foci, where Foreman Ware is frequent, and the Over Focus. Nonceramic artifacts were not distinctive, but a fragment of copper and a long bone object resembling an arctic snow beater are notable. These two objects suggest trade with the north, and the architecture of the houses is remarkably similar to certain examples reported for the northern Plateau. It seems suggestive that the Early Village people of the Plains may have cultural ties not hitherto recognized.

The third Smithsonian field party at work at the beginning of the year was directed by Dr. Robert L. Stephenson, assisted by Lee G. Madison. With a crew of 10 men they had begun excavations on June 19 of the previous year and continued work through August 31. Most of the season was spent on excavations at the Potts Village site (39CO19) on the right bank of the Missouri River, just south of Mobridge, S. Dak., in the Oahe Reservoir area. All or parts of seven houses were excavated, the fortification ditch was tested in several places, middens and cache pits were sampled, the entire stockade was uncovered, and the single loop bastion and two bastioned entrances were completely excavated.

This is the site of an early La Roche village that probably dates from about the late 15th or early to middle 16th century. It is entirely precontact, and no items of White origin were found in any part of the excavations. The site consisted of the remains of about 30 circular earthlodges, grouped in a long, oval area along the edge of the second terrace above the Missouri River. Within the village 11 houses, including a large ceremonial lodge, were encircled by a deep, narrow fortification ditch and palisade. The ditch was 6 to 8 feet in depth and 10 to 20 feet wide. The palisade was composed of upright cedar, cottonwood, and oak posts set close together. A single large loop bastion protected the north and west sides of the fortified area and a steep bank protected the east and southeast sides (toward the river).

Architectural details of the entrances to these fortified villages along the Missouri River have not previously been determined. On the basis of some evidence, simple overlapping lines of stockade posts with a passageway between have been presumed. At the Potts site two examples of a very distinctive entrance were clearly defined. In this type of entrance the stockade line curved outward and then back in toward the center of the fortified area to form a small loop bastion about 10 feet in diameter, but with one side forming a straight line of posts extending some 10 to 15 feet into the village. Parallel to the straight line of posts was another similar line about 4 feet from it

that extended outward from the fortified area and curved around to form a small loop bastion about 8 feet in diameter and then recurve back to join the regular line of the palisade posts. Thus the entrance consisted of two small, loop bastions with a narrow passageway between them that ran some 10 feet back into the fortified area. Opposite the narrow passageway was a ramp across the fortification ditch. One entrance was to the north, the other to the south.

Outside the fortified area the two houses that were partially excavated appeared of the same structural type and artifact content as those that were within the fort. The architecture was of the four center post pattern with widely spaced wall posts, leaner posts, and short entrances, forming a circular earthlodge of some 28 to 45 feet in diameter. Artifacts from the site include abundant pottery, bone, stone, and shell objects. The pottery is unusually homogeneous and well within the earliest of the La Roche tradition. Elaborate or spectacular objects were almost entirely lacking, although a few shell ornaments and catlinite pipes were recovered.

One week was spent in August by this party in excavating a portion of the Blue Blanket Island site (39WW9), located on an island in the Missouri River just north of the Potts Village site. This was a late village of circular earthlodges encircled by a wide, shallow fortification ditch and palisade. The palisade formed a nearly circular pattern enclosing less than 20 houses with no evidence of houses outside it. The ditch was but 2 or 3 feet deep and 20 to 25 feet wide. Half of one house was excavated, the ditch and palisade were sampled in several places, and a dozen random test squares were dug.

Stockade posts as well as outer wall posts of the house were split timbers set close together with the bark side in. Burning caused good preservation of the structural features. Inside the row of split wall timbers of the house were large, whole support posts spaced every 6 or 7 feet to form main roof and wall supports. The four main center posts were large, whole posts. The entrance was short but unusually well made. Pottery and other artifacts were not abundant but metal objects were present. The village apparently is one of those viewed by Lewis and Clark as a recent ruin in 1804, and probably dates from the last quarter of the 18th century until about 1802 or 1803. Access to the site each day was by motorboat from the right bank of the river near the Potts Village site.

The fourth Smithsonian field party at work during the early part of the fiscal year consisted of a crew of four men directed by Dr. William M. Bass. They worked from August 7 to 18 and excavated 40 burials from the Sully site (39SL4), some 19 miles northwest of Pierre, S. Dak., on the left bank of the Missouri River. Dr. Bass spent two previous seasons on burial excavations at that site and has

recovered a total of 264 interments there. It was thought that the brief stay during the 1961 season would exhaust the burial area and give a good statistical sample of a single population. However, it became evident that more burials are to be found there and plans were made to continue the work in the 1962 season. The Sully site unquestionably offers a better opportunity than any other to obtain a really meaningful sample of the protohistoric Arikara physical types in the Missouri Basin. Numerous artifacts were recovered with the burials. They include catlinite pipes, wooden pipe stems, a whole pottery vessel, glass and copper beads, woven mats, and bone tools.

The 1962 field season began early this year with a brief survey of the area to be flooded by the several proposed small reservoirs in the Salt-Wahoo Drainage Basin in Lancaster and Seward Counties, southeastern Nebraska. Robert W. Neuman, assisted by Lionel A. Brown and John W. Garrett, the latter a member of the staff of the Nebraska State Historical Society, spent April 5 and 6 investigating the areas designated as Dams 4, 8, 13, and 17. This initial survey revealed nothing of archeological interest in proposed flood areas of these four reservoirs. Construction activities at these dams should be watched, however, when the time comes for building the dams, as buried sites of the Archaic and Woodland periods might then be discovered.

The second Missouri Basin Project field party for the new season began work in the Pony Creek Drainage area of Mills County, southwestern Iowa, on May 1. There the Soil Conservation Service is building a series of small reservoirs and terracing large areas as protection against erosion. Lionel A. Brown, assisted first by Wilfred M. Husted, and later by Lee G. Madison, made an intensive survey of the area in immediate danger of destruction, and then with a crew of 3 men tested 7 of the 16 sites located. They completed the season's work on May 25. One house was excavated in each of three sites, 13ML205, 13ML206, and 13ML216. Extensive tests were made in sites 13ML201, 13ML204, 13ML208, and 13ML215. This party recommended further investigations in all of the sites, 13ML201 through 13ML216 except 13ML201, 13ML213, 13ML214, and 13ML215, which will either be out of danger of damage from construction or have no promise of yielding useful archeological information. The houses excavated were square to rectangular in shape and provided artifacts suggestive of the Aksarben Aspect and related materials.

The third field party, consisting of G. Hubert Smith and Jerry L. Livingston, visited the historic site of Fort Sully (39SL45) in Sully County, north of Pierre, S. Dak., during the period of May 15–18 for the purpose of making a topographic map of the site, but heavy rains made this impossible.

The fourth party, Smith and Livingston, made a survey of the area to be flooded by the Arcadia Dam in Custer County, Nebr., on May 19 and 20. One site, 25CU202, was located within the reservoir area, but it appeared to be of little archeological value.

On June 12, the fifth and sixth Missouri Basin field parties left for the field. Party No. 5, directed by Robert W. Neuman and assisted by John J. Hoffman and a crew of 10, began work on the early circular house village known as the Mostad site (39DW234) and by the end of the year was well along on the excavation of the fortification system of that site. Party No. 6, also directed by Neuman but assisted by James J. Stanek and a crew of 10, began work on the 2 burial mounds at the Swift Bird site (39DW233). By the end of the year this party had cleared a large part of one mound and was excavating the burial chamber within it. Both sites are on the right bank of the Missouri River some 8 miles south of Mobridge, in Dewey County, S. Dak., and will be in the bank-slumping area of the Oahe Reservoir. The two parties were camped together in the area between the two sites.

The seventh and eighth Missouri Basin Project field parties left for the field on June 7. Party No. 7, directed by Dr. Warren W. Caldwell and assisted by Richard T. Jensen and a crew of 11, began work on the Langdeau site (39LM209) in the neck of the Big Bend in the Big Bend Reservoir just above Lower Brule, Lyman County, S. Dak. By the end of the year this crew was well along with the excavation of three houses of long-rectangular pattern. Party No. 8, also directed by Dr. Caldwell but assisted by Richard E. Carter and a crew of nine, began work on site 39LM2, overlooking Medicine Creek, near the neck of the Big Bend in the Big Bend Reservoir, some 8 miles above Lower Brule, Lyman County, S. Dak. By the end of the year this crew had completed the excavation of one circular house but was finding evidence of an earlier occupation of the long-rectangular house period. These two parties were camped together at the Crazy Bull School House near Lower Brule.

The ninth Missouri Basin Project field party, under the direction of G. Hubert Smith assisted by Lee G. Madison and a crew of eight, left for the field on June 12. Based in Pierre, S. Dak., this crew at the end of the fiscal year was making progress on the excavations at the historic site of Fort George (39ST202) some 15 miles downstream from Pierre in Stanley County, in the area to be flooded by the Big Bend Reservoir. Prehistoric occupations lie beneath the historic fur trading post at that site and both historic and prehistoric components were being excavated.

The tenth Missouri Basin Project field party, directed by Dr. William M. Bass and assisted by Jon Muller and a crew of six, left Lin-

coln on June 7. Also based in Pierre with the Smith party, this crew, with the aid of heavy equipment, by the end of the year had excavated approximately 89 burials from a new area at the Sully site (39SL4) some 23 miles upriver from Pierre in Sully County. The rising waters of the Oahe Reservoir were beginning to encroach upon the site at that time. So far over 350 burials have been recovered from this one protohistoric Arikara site.

The eleventh Missouri Basin Project field party, directed by Dr. Alfred W. Bowers, assisted by William B. Colvin and a crew of 10, left for the field on June 14. Based in Mobridge, S. Dak., this party began excavating at the two adjacent sites, 39CO14 and 39CO34, at the mouth of the Grand River in Carson County. These sites are in the bank-slumping area of the Oahe Reservoir and were substituted for others that had become unavailable for excavation owing to impoundment of Oahe Reservoir waters. By the end of the year tests in middens, excavations of lodges, and samples of the fortification system were progressing well.

The twelfth field party, not scheduled to begin work until early in the following fiscal year, was to go to the Big Bend Reservoir.

The thirteenth Missouri Basin field party, directed by Lionel A. Brown with a crew of five, left for the field on June 13, and after a tortuous trip by pack train down Black Canyon into the Big Horn Canyon made camp at the confluence of the two canyons. The group began excavation of site 24BH215, adjacent to the party camp, in the bottom of the Big Horn Canyon some 6 miles upstream from the location of the Yellowtail Dam, Big Horn County, Mont. The site proved to be a large camping area and a few projectile points and potsherds had been recovered by the end of the year.

Party No. 14 also left for the field on June 13. It consisted of Wilfred M. Husted with a crew of five. The party established camp near the upper end of the Horseshoe Bend of the Big Horn River in Big Horn County, Wyo., in the upper reaches of the Yellowtail Reservoir area. They tested one site and partially excavated another but the terrain proved to be so rough that work without a boat was impractical. At the end of the year the men were making intensive foot surveys of that end of the canyon. There were prospects of obtaining a boat so that excavations could be resumed early in the coming fiscal year.

Party No. 15 left for the field on June 13 with Oscar L. Mallory in charge of a crew of three. This group began an archeological survey along the Missouri River between Fort Benton, Mont., and the upper reaches of the Fort Peck Reservoir. This is known as the Missouri Breaks area. Beginning near Fort Benton, the party had surveyed some 20 miles of the area by the end of the fiscal year and had located 19 sites, mostly tipi sites and rock cairns.

The sixteenth Missouri Basin Project field party, directed by Carl F. Miller, with a crew of nine, left for the field on June 15 and established headquarters in the town of Blue Rapids, Kans. By the end of the year this party had examined three of the sites in the upper reaches of the Tuttle Creek Reservoir in Marshall County, northeastern Kansas, and had begun testing one of them (14MH70).

Cooperating institutions working in the Missouri River Basin at the beginning of the fiscal year included six field parties, representing five State agencies in Nebraska, Kansas, South Dakota, and Missouri. Dr. Preston Holder, with a crew of students from the University of Nebraska, completed work during July on the Leavenworth site (39CO9), 10 miles north of Mobridge, S. Dak., in the Oahe Reservoir area. Dr. Carl H. Chapman and a crew from the University of Missouri continued the survey and testing of sites in the Kaysinger Bluff Reservoir area on the Osage River in west-central Missouri during the period July to September. In addition, Chapman had a University of Missouri crew at work on the survey of the Stockton Reservoir in a branch of the Osage River in Cedar and Dade Counties, Mo. Thomas A. Witty with a group from the Kansas State Historical Society was excavating the Woods site (14CY30) and testing several other sites in the Milford Reservoir area on the Republican River in Geary County, Kans. Roger T. Grange and a crew from the Nebraska State Historical Society was at work in the Red Willow Reservoir basin in Frontier County, southwestern Nebraska. This reservoir is nearly completed and by the end of this field season will begin to fill. Dr. Preston Holder, assisted by Dr. Emily Blasingham and a crew of students from the University of Nebraska, was at work on excavation, testing, and survey of sites in the Norton Reservoir area of northwestern Kansas. Dr. Carlyle S. Smith, assisted by Walter Birkby and a crew of students from the University of Kansas, began work in June excavating two key sites and testing several others in the Melvern Reservoir area in Osage County, east-central Kansas. Dr. Carl H. Chapman and a crew from the University of Missouri were continuing the survey and testing of sites in the Kaysinger Bluff Reservoir area in west-central Missouri and, with a second crew, was at work sampling sites in the Stockton Reservoir area in Cedar and Dade Counties, Mo. All the cooperating institution parties mentioned above were operating under agreements with the National Park Service and cooperating with the Smithsonian Institution in the Inter-Agency Archeological Salvage Program.

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

The Missouri Basin Chronology Program by the end of the year had been in operation 3½ years, having been begun by archeologists of the Missouri Basin Project in January 1958. Cooperation and continued participation by most of the archeologists in the Plains area have been most encouraging. Especial emphasis last year was on the dendrochronological section of the program, particularly the master chart for the Fort Thompson-to-Cheyenne River area. During the fiscal year many wood samples from prehistoric houses were matched to this chart and considerable effort was devoted to the refinement of the laboratory techniques of tree-ring study being used in the Lincoln office. To this end additional equipment was purchased, such as microscopes, a De Rouen Dendrochronograph, a power sander, and an increment borer. Also, consultations and advice were sought from the staff of the laboratory of tree-ring studies at the University of Arizona, and much assistance was obtained from these discussions.

The carbon-14 section of the Chronology Program received major attention throughout the year. Seven additional dates were obtained from charcoal samples submitted to the University of Michigan Memorial Phoenix Laboratory. In addition to this source of C–14 dates, an agreement was entered into between the Chronology Program and Isotopes Incorporated, of Westwood, N.J., under the direction of Milton Trautman, to date a series of charcoal specimens. The agreement with Isotopes Incorporated has resulted in 19 dates so far derived from the Missouri Basin Chronology Program.

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. The accomplishments of the laboratory and office staff are listed in tables 1 and 2.

Dr. Robert L. Stephenson, chief, when not in charge of field parties, devoted a large part of his time to management of the over-all Missouri Basin Project. His individual archeological research and report writing were minimal during the year, but he made some further progress on the monograph reporting the "Archeological Investigations in the Whitney Reservoir, Texas" and on the analyses of specimens from the Sully site (39SL4) in the Oahe Reservoir. Throughout the year he continued to serve 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 of the *Plains Anthropologist*. At the 19th Plains Conference for Archeology, held in Lawton, Okla., on Thanksgiving weekend, he served as chairman of the session on "Salvage Archeology in the Plains" and presented a paper on "Three Smithsonian Salvage Sites" and also one on "Historic Montana Burials."

Dr. Stephenson attended the meeting of the "Committee for the

Recovery of Archeological Remains" held in Washington, D.C., on February 8–9 and reported on the Missouri Basin Project activities of the past 2 years and the prospects for the coming year. He attended the annual meeting of the Nebraska Academy of Sciences in Lincoln on April 13. During the period April 15–22 he was in Austin, Tex., serving as technical adviser and making studio sequences for a motion picture on salvage archeology in the Plains area. From April 28 to May 8 he attended the Society for American Archeology annual meeting at Tucson, Ariz., where he presented a paper on "Administrative Problems of the River Basin Surveys." While in Tucson he conferred with the staff of the Laboratory of Tree-Ring Research and of the Geochronology Laboratory of the University of Arizona. During the year he wrote several book reviews for scientific journals and gave talks to various local civic organizations. Among the latter was the Omaha, Nebr., Kiwanis Club meeting to honor Dr. Ahmed Fakhry and the Tutankhamun exhibit at Joslyn Art Museum on May 9, and the meeting of the planning committee for the Heartland Exhibit at the New York World's Fair in 1964–65, held in Omaha on May 17. From June 17 to 24 he visited the field parties in Montana and at the end of the year was back in the Lincoln office.

Lionel A. Brown, archeologist, joined the staff on April 2 and spent the ensuing month in the Lincoln office learning field and laboratory procedures and preparing for the summer's field work. He was in the field from May 1 to 25 conducting surveys and excavations in the Pony Creek Drainage area of southwestern Iowa. On June 13 he again left for the field, where at the end of the year he was excavating in the Yellowtail Reservoir in Montana.

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 two drafts of a monograph entitled "Archeological Investigations at the Black Partizan site (39LM218), Big Bend Reservoir, South Dakota," and that is now ready for final revision. He continued sporadic work on the revision of his manuscript "The Archeology of Wakemap," wrote several reviews for various scientific journals, and had the following three technical articles and one monograph published: "Archeological Excavations at the Coralville Reservoir, Iowa," published in Bureau of American Ethnology Bulletin 179, River Basin Surveys Paper No. 22, 1961; "Tree Ring Investigations in Central South Dakota," published in abstract in the Proceedings of the 72d Meeting of the Nebraska Academy of Sciences, 1962; "Tree Ring Dating and the Village Cultures of South Dakota," published in *Progress* of the Interior Missouri Basin Field Committee, 1962; and "The Missouri Basin Chronology Program, Statement No. 3," published by offset in the Missouri Basin Project office, 1962.

Throughout the year he served as collaborator for the Plains area on *Abstracts of New World Archeology* and prepared abstracts of 10 articles for that publication. In addition, he served as contributing editor for Plains literature and reviews for the *Plains Anthropologist*, and (on annual leave) as part-time assistant professor of anthropology at the University of Nebraska, as well as continuing his position as chairman of the dendrochronology section of the Missouri Basin Chronology Program. On April 14 he attended the annual meeting of the Nebraska Academy of Sciences where he presented a paper entitled "Tree Ring Investigations in Central South Dakota" and served as a panel discussant in a symposium on "Modern Research Methods in the Field of Ethnohistory." He attended the 27th annual meeting of the Society for American Archeology in Tucson, Ariz., on May 3–5, where he participated in a symposium on "Tree Ring Dating" and also conferred with the staff members of the Laboratory of Tree Ring Research and the Geochronology Laboratory at the University of Arizona. At the end of the year he was again engaged in excavating archeological sites in the Big Bend Reservoir area.

Wilfred M. Husted, archeologist, joined the staff on April 16 and spent the rest of that month in the Lincoln office learning field and laboratory procedures and preparing for the summer's field work. During May 1–11 he was in the field with Brown in the Pony Creek Drainage area in Iowa. On June 13, he again left for the field where, at the end of the year, he was excavating in Yellowtail Reservoir area in Wyoming.

Robert W. Neuman, archeologist, when not in the field conducting excavations, was at work analyzing archeological materials he had previously excavated in the Big Bend and Oahe Reservoir areas. He completed one monograph entitled "The Good Soldier Site, Lyman County, South Dakota," which will appear as River Basin Surveys Paper No. 37 in Bulletin 189 of the Bureau of American Ethnology. The major portion of his laboratory research time was devoted to an analysis of data and the development of a trait list for burial mounds in the Middle Missouri and northern Plains areas, the compilation of a report on preceramic horizons in the Fort Thompson vicinity, and an article on check-stamped pottery in the northern and central Plains. Throughout the year he served as chairman of the carbon-14 section of the Missouri Basin Chronology Program. Over the Thanksgiving weekend he attended the Plains Conference for Archeology at Lawton, Okla., where he presented a paper on "The 1961 Missouri Basin Project Field Season" and another on "Historic Indian Burials near Fort Thompson." On April 13 he attended the annual meeting of the Nebraska Academy of Sciences in Lincoln and presented a paper entitled "Check Stamped Pottery on the Central and Northern Plains," which was published in abstract in the proceedings of the meeting.

On May 4–5 he attended and participated in the annual meeting of the Central States Anthropoligical Society in St. Louis. At the end of the year he was again in the field conducting archeological excavations.

G. Hubert Smith, archeologist, was on duty at the first of the year in the Lincoln office continuing work on the comprehensive report of investigations at the site of Like-a-Fishhook Village and Fort Berthold I and II (32ML2), in the Garrison Reservoir, North Dakota. He devoted most of his efforts during the year to this report and had completed most of a first draft of it by the end of the year. During the period July 21–29 he accompanied the chief on a trip to Montana and Wyoming, particularly to consult with Bureau of Reclamation officials in regard to the salvage and preservation of Fort C. F. Smith at the mouth of the Big Horn Canyon in Montana, near the construction area of the Yellowtail Dam. He attended the 19th Plains Conference for Archeology at Lawton, Okla., on Thanksgiving weekend and served as chairman of a session on "Historic Sites Archeology and Ethnography." On April 13 he attended the annual meeting of the Nebraska Academy of Sciences in Lincoln and participated in a symposium on "Research Methods in Ethnohistory." On May 5 he attended and participated in the annual meeting of the National Trust for Historic Preservation held in Omaha, Nebr. Throughout the year he served as chairman of the historic documentation section of the Missouri Basin Chronology Program and as a member of the editorial board of the *Plains Anthropologist*.

During the period of May 15–20 he was in the field visiting the Fort Sully site in the Oahe Reservoir area of central South Dakota and making an archeological survey of the Arcadia Reservoir area in central Nebraska. On June 12 he returned to the field where he was again conducting excavations in the Big Bend Reservoir area at the end of the year.

TABLE 1.—*Specimens processed, July 1, 1961–June 30, 1962*

Reservoir	Number of sites	Catalog numbers assigned	Number of specimens processed
Arcadia	1	5	29
Big Bend	9	2, 435	64, 892
Fort Randall	1	5	8
Lewis and Clark	1	4	20
Oahe	9	1, 971	17, 457
Sites not in a reservoir area	5	325	1, 274
Total	26	4, 745	83, 680

As of June 30, 1962, the Missouri Basin Project had cataloged 1,339,396 specimens from 2,152 numbered sites and 59 collections not assigned site numbers.

Specimens restored: 5 pottery vessel sections.

Specimens donated to the Missouri Basin Project for comparative use:

Thirty-one pot rim sherds representing Fort Rice and Huff wares—State Historical Society of North Dakota, courtesy of W. Raymond Wood.

Thirty-one trade beads—University of Texas, courtesy of Edward B. Jelks.

Three United States Army buttons dating 1850–70—courtesy of S. J. Olsen, Florida Geological Survey.

TABLE 2.—*Record material processed, July 1, 1961–June 20, 1962*

MISSOURI BASIN PROJECT

Reflex copies of records	3,809
Photographic negatives made	1,135
Photographic prints made	3,392
Photographic prints mounted and filed	1,673
Transparencies mounted in glass	564
Kodachrome pictures taken in lab	156
Cartographic tracings and drawings	55
Illustrations	29
Lettering of plates	10
Profiles drawn	33
Plate layouts made for manuscripts	10

Virginia.—An archeological reconnaissance was made during the period from April 3 to May 11 at the Smith Mountain Project on the Roanoke River in southern Virginia. That is an Appalachian Power Co. undertaking and consists of the construction of two dams—Smith Mountain and Leesville—which will provide water for power purposes. The two reservoirs they will form will be located in Bedford, Franklin, and Pittsylvania Counties, Va. The survey was made by Carl F. Miller. His work was greatly facilitated by complete cooperation on the part of personnel of the Appalachian Power Co. and the Nello L. Teer Construction Co. The power company provided a helicopter which made possible a study of the reservoir areas from the air and also the taking of aerial photographs of the more important sites.

Mr. Miller located and recorded 35 sites in the Smith Mountain basin and 17 sites in the Leesville basin. Of the total of 52, only 1 will not be endangered by the inundation of the 2 areas. However, after careful examination of the surfaces and the testing of some sites, Mr. Miller concluded that only four of them merited excavation and detailed study. Three are in the Smith Mountain basin, while the fourth is in the Leesville basin. The sites cover the Early, Middle, and Late Woodland periods, involving a timespan beginning about 3000 B.C. and lasting to about A.D. 1000. They are significant be-

cause of the fact that they occur upstream from the James H. Kerr Reservoir where extensive archeological studies were made several years ago and, while related to the manifestations present there, they appear to contain some cultural elements which were not found farther downstream. Excavations will be made at Smith Mountain during the next fiscal year.

ARCHIVES

The Bureau archives continued under the custody of Mrs. Margaret C. Blaker, archivist.

Following the death of Dr. John P. Harrington, extensive series of his linguistic and ethnographic notes relating to numerous North American Indian tribes were returned from private storage and deposited with the Bureau through the courtesy of his daughter, Miss Awona W. Harrington. This material is voluminous and has become disarranged during years of storage. To serve as a preliminary guide, a list of the manuscripts, with particular attention to those dealing with Indian languages of California, was prepared by Miss Catherine Callaghan, scientific linguist.

A collection of letters, family records, and photographs from the estate of Matilda Coxe Stevenson, relating mainly to Mrs. Stevenson, although some pertained to her husband, Col. James Stevenson, was received as a gift from Manning Gasch of McLean, Va.

Two copybooks containing Micmac ideograms and an interlinear transcription of the Micmac words written about 1943 by Frank Navin, an Indian of Cape Breton, Nova Scotia, were lent by the Rev. Father Placide, O.F.M., Cap., Ristigouche, Quebec, to be microfilmed for the Bureau archives.

A collection of over 4,000 photographic prints relating to North American Indian tribes was transferred from the U.S. National Museum. The prints have been sorted and arranged by cultural area and tribe, but much remains to be done in tracing the original accession data in order to determine actual or terminal dates and other relevant background information.

Forty-two photographs relating to several Hopi pueblos, taken by Miss Margaret Brainard in 1929–31, 1938, and 1950, were donated by her.

Thirty-six color transparencies of North Carolina and Oklahoma Cherokee, taken by Raymond Fogelson in 1960, were donated by him.

Thirty-three photographs of persons of Indian descent living in Virginia, Maryland, Delaware, Maine, and Quebec, taken by Daniel Kennedy in 1960 and 1961, were donated by him.

Sixteen photographs of Chippewa Indians taken in 1905 at Grand Marais and Grand Portage, Minn., by Frances Densmore before she became affiliated with the Bureau were donated by Eliot Davis,

superintendent of Grand Portage National Monument, Grand Marais, Minn.

Seven photographs of western Indians were lent for copying by Vernon M. Riley of Chino, Calif.

As in previous years the manuscript and photographic collections were consulted by numerous scholars and members of the general public. There were approximately 175 written and personal inquiries about manuscripts, including requests for microfilm copies, and approximately 600 inquiries about and requests for photographic prints. Over 2,450 photographs were prepared and distributed, an increase over last year's figure.

ILLUSTRATIONS

The illustrator devoted most of his time to preparing and completing a variety of tasks in the fields of archeology, anthropology, and ethnology. Work was also prepared for the River Basin Surveys and for several other branches of the Institution.

LIBRARY

A reference librarian was appointed for the Bureau of American Ethnology Library in May 1962, to provide library services for the staffs of the Bureau and other branches of the Smithsonian Institution, and other qualified scholars. Rearrangement of the library's collection has already been completed, and it is planned to organize and maintain the collection so that it will realize its potential usefulness.

In the process of shifting materials, various interesting publications have attracted attention, among them what seems to be the original *Circular in Reference to Degrees of Relationship Among Different Nations* by Lewis Henry Morgan and a good collection of congressional reports pertaining to Indian affairs beginning with the 12th Congress. Several early editions of encyclopedias, dictionaries, and gazetteers have been gathered together and made more accessible for the patrons.

The valuable reprint collection has been organized and an author index made with assistance of summer student employees.

Special emphasis will be placed on the strengthening of this library's collection by filling gaps in important serial runs, reactivating and following up on exchange materials, and the acquisition of important works, both retrospective and current.

EDITORIAL WORK AND PUBLICATIONS

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

Seventy-eighth Annual Report of the Bureau of American Ethnology, 1960–61. ii+33 pp., 2 pls. 1962.

Bulletin 175. Mohave ethnopsychiatry and suicide: The psychiatric knowledge and the psychic disturbances of an Indian tribe, by George Devereux. vi+586 pp., 10 pls. 1961.

Bulletin 179. River Basin Surveys Papers, Nos. 21–24, Frank H. H. Roberts, Jr., editor. xviii+337 pp., 56 pls., 43 figs. 1961.

No. 21. Excavations at Texarkana Reservoir, Sulphur River, Texas, by Edward B. Jelks.

No. 22. Archeological investigations at the Coralville Reservoir, Iowa, by Warren W. Caldwell.

No. 23. The McNary Reservoir: A study in Plateau archeology, by Joel L. Shiner.

No. 24. The Sheep Island site and the Mid-Columbia Valley, by Douglas Osborne, Alan Bryan, and Robert H. Crabtree.

Bulletin 183. Seneca Thanksgiving rituals, by Wallace L. Chafe. iii+302 pp. 1961.

Publications distributed totaled 19,326, as compared with 29,845 for the fiscal year 1961.

COLLECTIONS

The following collections were made by staff members of the River Basin Surveys of the Bureau of American Ethnology and transferred to the permanent collections of the Department of Anthropology, U.S. National Museum:

Acc. Nos.	
236771, 238626, 238627	11,560 miscellaneous stone, bone, and shell archeological specimens from various localities in the United States.

MISCELLANEOUS

Dr. M. W. Stirling, Dr. A. J. Waring, and Sister Inez Hilger continued as research associates. Dr. John P. Harrington, linguist on the staff of the Bureau from February 20, 1915, until his retirement on April 30, 1954, and later research associate, died on October 21, 1961, in San Diego, Calif., after many months' illness.

Dr. Wallace L. Chafe worked part time during the academic year 1961–62 so that he could teach linguistics in the graduate school at Catholic University of America.

Robert M. Laughlin reported for duty on June 10 as ethnologist specializing in the Middle American area.

The Bureau revised and reissued during the fiscal year the following bibliographies and lists:

SIL–47, rev., 8/61: Selected bibliography on the Battle of the Little Big Horn. 5 pp.

SIL–90, rev., 3/62: Bibliography on American Indian medicine and health. Compiled by William C. Sturtevant. 39 pp.

SIL–65, 3d rev., 3/62: Introductory bibliography on the American Indian. 7 pp.

SIL-53, rev., 4/62: Photographic collections of the Bureau of American Ethnology. 2 pp.

SIL-90, rev., 4/62: Some dealers in second-hand anthropological and government publications. 2 pp.

SIL-50, 4th rev., 6/62: Selected list of portraits of prominent Indians in the collections of the Bureau of American Ethnology. 3 pp.

SIL-81, rev., 6/62: Selected bibliography on stone-chipping methods. 4 pp.

Although the 3,227 letters received in the director's office during the year indicate a decrease from the previous year, the total is well above the average for the past several years. This number, of course, does not include semiofficial letters received by staff members from colleagues and interested individuals. Because the Bureau does not maintain a mailing list for its bibliography series, many college and university librarians write in for complete sets and for information leaflets. About 8,000 informational items were mailed from the main Bureau office in response to requests for such material. The above totals do not include Bureau material and publications sent out by the Editorial and Publications Division. Many lots of specimens were received by mail or brought to the office for identification and for such information as could be provided by Bureau specialists.

Respectfully submitted.

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

DR. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the 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, 1962:

The Astrophysical Observatory includes two divisions: the division of astrophysical research in Cambridge, Mass., for the study of solar and other types of energy impinging on the earth; and the division of radiation and organisms in Washington, for the investigation of radiation as it relates directly or indirectly to biological problems. Shops are maintained in Washington for work in metals, woods, and optical electronics, and to prepare special equipment for both divisions; and a shop conducted in cooperation with the Harvard College Observatory in Cambridge provides high-precision mechanical work. The field station at Table Mountain, Calif., was discontinued. 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. Leo Goldberg, with Dr. William Liller, is directing the design and construction of the ultraviolet scanning spectrometer 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 spectral range of the spectrometer will be 500 A. to 1,500 A. and the resolving power will be about 1.0 A. Calibration and testing of the instrument packages will be carried out in a new laboratory of the Space Science Building.

The scanning spectrometers are scheduled for rocket flights at the end of 1962 and for flight aboard the S–17 satellite during the first quarter of 1963.

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The work of the laboratory also includes a broad program of basic research on the vacuum ultraviolet radiation of atoms and molecules of astrophysical importance with 1- and 3-meter vacuum spectrographs and a shock tube and flash tube as sources.

Trying to account for the effect of solar-radiation pressure on the drag of the Explorer IX satellite, Dr. Luigi G. Jacchia, assisted by Jack Slowey, found that the computed variations of orbital eccentricity for that satellite are 3 percent too small when the old value of the solar constant, 1.94 ly. min^{-1}, is used; the discrepancy disappears when use is made of the new value, 2.00 ly. min^{-1}, proposed in 1960 by F. S. Johnson to account for the excess ultraviolet radiation. This experience suggests that artificial satellites, of appropriate construction and in appropriate orbits, could be used for a better determination of the solar constant, although there remain serious difficulties connected with the earth's albedo and with the reflectivity and the spin of the satellite.

Dr. Max Krook proceeds with his theoretical investigations into the further development and application of methods for determining the structure of nongray atmospheres. He is also applying, in a number of cases, methods developed in continuum theories in gas dynamics to problems of the flow of rarefied gases; examining various problems in the dynamics of ionized gases (e.g., the structure of shock fronts in the presence of magnetic fields); and studying the exact solution of one-dimensional problems in the kinetic theory of gases.

Dr. Charles A. Whitney has completed several projects related to his long-range studies of stellar atmospheres and stellar pulsation. He has devised a simple but powerful new computational method for the smoothing of spectrophotometric data, a central problem of observational astrophysics hitherto dependent on subjective procedures. His comparison of theoretical with observed duration of line-splitting in the spectrum of a pulsating variable (W Virginis) reveals excellent accord with previous observations. His investigation of the reaction of a stellar atmosphere to abrupt variations in heat flux from below has resulted in a formula that will aid in distinguishing between fluctuations from variable heating and those from sound waves propagating through the atmosphere. From his study of the structure of shock fronts in hydrogen he has found, with the aid of Angelo J. Skalafuris, that radiation produced by recombination behind the shock heats and ionizes the gas ahead of the shock, thus significantly altering the flow and temperature patterns.

With the assistance of Mr. Skalafuris and W. Kalkofen, Dr. Whitney has studied ionization relaxation with a one-level atom, an essential aspect of the general shock problem, and has drawn some significant conclusions on temperatures which, with other results, will bear importantly on the whole program in this area.

Studies on the structure of stellar atmospheres continues along several lines. Dr. Owen F. Gingerich, investigating radiative equilibrium, has introduced into his computer program new correctional procedures developed by Dr. Krook and Dr. Eugene Avrett and is preparing several manuscripts for publication. David W. Latham's work on convective equilibrium will provide a basis for the theoretical study of solar granulation, a subject to which Dr. Whitney's work on thermal relaxation (performed with Alan Krasberg) will contribute. Dr. Whitney is also carrying out tests to determine the magnitude of departures from local thermodynamic equilibrium in stellar atmospheres; is attempting to interpret the periodicity of small-scale motions in terms of cepheid-like pulsation; and has begun a new study of the structure of the lunar surface by means of optical, infrared, and radio data.

During this period Miss Sylvia Boyd and Barry Goldstein completed measurements of the profiles of 30 absorption lines in 25 spectra of pulsating variables. Robert B. Stefanik studied the time-dependence of hydrogen excitation in a varying electron gas to determine the type of atomic model necessary for obtaining realistic shock structures.

Dr. Paul W. Hodge and Dr. Frances W. Wright have been investigating the possible presence in the Large Magellanic Cloud of Population II Cepheids, at present not known to exist there. They have concentrated on the globular clusters as the most likely location, in the vicinity of which previously known and new variables have been studied for periods, brightness, and light-curve characteristics.

Dr. Richard McCrosky made further progress in his observations of Raman scattered Lyman α to determine the still unknown percentage of hydrogen molecules in interstellar space. He is using for this purpose the infrared sensitive detectors on the Harvard College Observatory 61-inch telescope.

Dr. Henri E. Mitler is making a theoretical and analytical study of the possibility of optical cosmic-ray detection, on the assumption that information obtained from the Cerenkov light pulse might lessen the need for the usual huge counter array. He has nearly completed his analysis of the probable amount of He^3 produced in planetesimals and its effect on concurrent element formation, the determination of which is crucial for testing the cosmogonic theory of Fowler, Greenstein, and Hoyle. Dr. Mitler is also investigating single-particle energy levels in nuclei for possible application of the Hartree-Fock theory (especially for predictability of low-lying excited states), in preference to Brueckner's t-matrix.

Dr. Thomas W. Noonan is attempting to formulate, and then solve, certain problems in cosmology and general relativity, especially in the field now being studied at the Harvard College Observatory under the direction of Dr. David Layzer.

Meteoritical studies.—Dr. E. L. Fireman, Dr. David Tilles, and J. De Felice continue their measurements of radioactive isotopes in recently fallen meteorite and satellite material. Dr. Fireman has established that the Ehole meteorite fell August 31, 1961. The quantities of helium-3, argon-37, and argon-39 present are similar to those found in the previously measured Bruderheim and Hamlet meteorites, an indication of a similar history of cosmic-ray bombardment. Almost completed are measurements of those isotopes in the separated stone and iron phases of the Harleton meteorite, to determine the sources of excess argon-37. Dr. Fireman and Mr. De Felice have measured helium-3 and argon-39 in the metallic phase of a stony (Bruderheim) meteorite. Results of their analysis of uranium, potassium, argon-40, and krypton-xenon in iron meteorites by neutron activation will be important in determining the age and early history of the meteorites.

The most important results from the study of radioactive isotopes in recovered satellites were the discoveries that solar flares contain 1 percent tritium and that Van Allen particles also contain 1 percent tritium. The program will continue to provide information on the intensity, energy spectra, and isotopic composition of the trapped hydrogen nuclei in the Van Allen belts, as well as on the flux of primary high-energy cosmic rays in the vicinity of the earth.

Dr. Ursula B. Marvin, while investigating accessory minerals in meteorites, discovered in an iron sample the presence of cristobalite, which appears to contradict metallurgical evidence requiring far higher pressures of atmospheres than this mineral can theoretically tolerate. In association with Professor C. Frondel she has also studied the meteoritic phosphate mineral merrilite, apparently having the structure of whitlockite. Analysis of both these minerals should provide useful information on the geochemical environment of the meteorites at the time of formation.

With Dr. Fireman and Dr. Tilles, she is attempting to separate 100 mg. mineral samples from stony meteorites to determine the areas of noble gas isotopes and trace elements. The study seeks light on the early history of the meteorites and the solar system. For such analysis and other isotopic measurements, Dr. Tilles continues work on the construction of a high sensitivity mass spectrometer, which, when completed, should augment present scanty knowledge of primordial and radiogenic noble gases in iron meteorites and help elucidate the age, cooling history, and formation of the irons. Dr. Tilles has initiated an additional investigation of hydrogen and tritium retention in the metal of meteorites as a means of studying their temperatures in space and to help explain the widely varying tritium content of the metal phase of stony and iron-nickel meteorites.

Dr. F. Behn Riggs is experimenting further with his design of an electron probe microanalyzer, which makes possible a point-by-point chemical analysis of polished surfaces of sectioned meteorites without destroying the material. Combined with other metallurgical techniques, it should throw light on the nature, history, and formation of meteorites. His analyses so far show the need for a spectrometer, now under construction, to scan X-ray wavelengths for the presence of elements interfering with best results.

Dr. John Wood has been studying the composition of chondrules to determine whether his hypothesis, that they are hardened droplets of liquid silicates which condensed from the vapor phase during the origin of the solar system, is compatible with current solar theories. Estimating temperatures and pressures in the models of Hoyle and Cameron, and comparing them with those at which liquid silicates and liquid metallic iron are stable, he concludes that conditions do obtain in these models under which the droplets might condense. If, as he has postulated, the chondrites should in fact prove to be original planetesimals from which both planets and chrondrites accreted, research into the birth and history of the planets can be greatly advanced.

Important in this connection is Dr. Wood's almost completed analysis of the compositional variation of about 50 chondrules separated from the chondrite Bjurböle. For his quantitative arc spectrographic study he has used equipment available at the Cabot Spectrographic Laboratory at Massachusetts Institute of Technology. Dr. Wood has also extended his investigations to the chondrite Renazzo, probably a sample of quite primitive, unaltered planetary material, the detailed mineralogy of which should reveal the nature of processes operating during the origin of the planets. He is using the services of the Advanced Metals Corporation of Cambridge for his microchemical determinations. From his examination of the probable metamorphism of most chondrites, Dr. Wood is offering in a forthcoming paper a hypothesis to explain the mineral peculiarities of unmetamorphosed (e.g., Renazzo) chondrites.

Dr. Pedro E. Zadunaisky's study of the definitive orbit of Comet Halley 1910, to test current theories about forces perturbing the elliptic-orbit motion of a comet, has now achieved three written and tested computer programs. Interpretation and reporting of results will follow further development of these programs.

Dr. Richard E. McCrosky, in collaboration with the Harvard College Observatory, the United States Air Force, Lincoln Laboratory, and NASA, has progressed in his attempt to reproduce meteor phenomena by injecting into the upper atmosphere, at meteoric velocities, bodies of known and sufficient size. His results are of critical importance in calibrating the mass-luminosity and density scale of natural meteors in the optical range.

Dr. McCrosky's project of seeking recovery of meteorites as soon as possible after their fall, to provide data on the intensity of cosmic-ray intensity near the earth and throughout the orbit of the meteorite, is approaching actual implementation. In the first such large-scale use of automatic photography for the purpose, he will direct a network of 16 camera stations in the Midwest which will record meteors in flight and from analysis of the film indicate the probable site of meteoritic landing. To this site, from headquarters in Lincoln, Nebr., designated searchers will make their quick-recovery trips and forward the material for analysis. Field testing of the cameras has been carried out, and the first station is expected to begin photographing in November, with hopes that the entire program may be in operation by the summer of 1963. Results should greatly increase our present knowledge of the numbers, masses, and orbits of meteorites. Dr. McCrosky is being assisted by Messrs. Tougas, Munn, and Wargo.

Dr. Salah Hamid has found from his study of the selection effects on the orbital elements of short-period photographic meteors that a true distribution of the eccentricity and perihelion distance of the interplanetary particles corresponds to previous observations, and that any comparison between theoretical and observed distributions must consider separately meteors meeting the earth at the ascending node and those meeting it at the descending node. His examination of the age of short-period photographic meteors, though employing a different method, confirms the 10^4-year estimate of the director and Dr. Luigi Jacchia.

From his study of the Quadrantids meteor stream, Dr. Hamid concludes that it originated from a comet captured by Jupiter 3,000 years ago and that its inclination, owing to perturbations of the planet, changed from 13° to 75°. Investigating the question of a possible common origin of this stream with the apparently unrelated δ-Aquarid stream, he found that both stem from the same comet, but that their differing approaches to Jupiter (and its perturbations) have markedly affected their different duration, perihelion distance, and present position. This study should be useful for investigation of other meteoritic problems, such as the rest of the Aquarid stream complex and the Toroidal groups.

Dr. R. Southworth's project of observing faint meteors for data basic to meteor studies has involved planning and supervising the computations of the trajectory and the previous orbit around the sun of meteors observed by the radar system of the Harvard Radio Meteor Project near Havana, Ill. His observations of fainter meteors than have been previously made by this method show excellent results in accuracy and homogeneity. He has progressed satisfactorily also in his study of the dynamical history of meteor streams, a problem

both important to the whole subject of meteors and probably helpful in the study of other objects and events in interplanetary space.

Robert E. Briggs completed his study of the space distribution of interplanetary dust particles. He found that the light scattered by the computed distribution is in good agreement with observed zodiacal light, particularly along the ecliptic, and that most of the particles must have diameters of the order of 1 micron and fairly rough surfaces of low reflectivity. He is now turning his attention to the velocity distribution of interplanetary dust particles. The results of this study should be valuable for current and future research on the nature of interplanetary space, and perhaps provide new estimates on the significance of particle collisions and breakup.

Dr. Paul W. Hodge and Dr. Frances Wright continue their study of the rate of accretion of meteoritic matter by the earth, especially that in the form of dust particles collected by jet aircraft at altitudes ranging from 30,000 to 90,000 feet. They plan to analyze material gathered at even greater heights on the X–15. In addition, they have examined dust from very old ice deeply embedded in the Greenland and Arctic icecaps.

The director's study of the erosion and puncturing of bodies in free space continues. The preliminary results obtained have been reported at three scientific meetings and two publications in press. In brief, he has found that space erosion increases from a few angstrom units per year for irons to 10 times this rate for stones and nearly a thousand times greater rate for fragile material from comets. The correlation of erosion rate with brittleness or compressive strength indicates cratering by impacts with dust particles in space. A mean space density of about 10^{-22} gm/cm^3 is required, consistent with measures of scattered sunlight. Near the earth a higher rate appears to prevail, possibly from moon dust, as he has previously suggested. The most dangerous place with respect to meteoritic puncture is probably the moon's surface. The project has importance for fundamental research on the interplanetary medium and for space engineering problems.

Dr. Fred A. Franklin has completed his dynamical and photometric studies of the rings of Saturn. He has obtained for rings A and B the values of their optical and physical thicknesses, their masses, and the fraction of their volume occupied by particles. He now also has a value for the average radius of the individual particles and a measure of the roughness of their surfaces. The derived thicknesses of the rings are surprisingly small, measured in inches. The rings are found to be an enduring feature of the solar system.

Space studies.—Two major projects for Orbiting Astronomical Observatories have made satisfactory progress. The director and Dr.

Robert J. Davis, astrophysicist in charge, with other Observatory scientists, have concentrated on "Celescope," the series of telescopes intended for orbiting in artificial satellites above the earth's atmosphere. Equipped to provide television images in four colors of the entire celestial sphere, this vital new technique, when completed and in operation, will vastly extend astronomical observation to the far ultraviolet region of the spectrum and prepare the way for further detailed studies of objects and areas revealed by the surveys. Contracts have been completed for fabrication of two Aerobee-Hi rocket payloads carrying a prototype Celescope of simplified design to test critical electronic equipment and the brightness of stars in the ultraviolet. These stars, found in recent observations by NASA and others to be 10 times fainter than supposed, require more sensitive television camera tubes ("uvicons") and larger optics than were originally available for the experimental flight. Now that better uvicons are available, the rocket payloads will be rebuilt to accept them. Contract for the satellite payload has been awarded, and construction is proceeding.

In connection with this problem Dr. Om P. Rustgi has set up a laboratory for absolute calibration of uvicons, a matter of highest importance to the project for measuring stellar and interstellar radiation.

Rocket failures and the insufficiently sensitive tubes have delayed the program, but successful orbit is expected in 1964. The Celescope project is being conducted in cooperation with NASA's Orbiting Astronomical Observatories Program, which provides auxiliary equipment and support, but the scientific management of the experimental payload and analysis of the results remain the Smithsonian's responsibility. The long-range plan is for development of even more powerful celescopes and equipment.

Dr. G. Colombo, professor of theoretical mechanics at the University of Padua, Italy, during his 2-year stay at the Observatory has analyzed the stabilization of a satellite at the point of equilibrium between the earth's and the moon's gravitational forces and is exploring the feasibility of a high sensitivity device for detecting displacement which would significantly affect techniques of space navigation and communication. He has also completed an analysis of the motion of Explorer XI (1961 Gamma) around its center of mass and demonstrated qualitatively that variations of its angular momentum are explicable only by the interaction of the earth's magnetic field and the body of the satellite.

Dr. Colombo has recently initiated a study of numerical integration in the semirestricted three-body problem (including radiation pressure from a fourth body) to investigate the possible use of such pressure for transferring earth-around-moon orbits of satellites with large

A/m ratios to moon-around-earth orbits. Related research includes the effect of lunar orbital eccentricities on moon satellites with large semimajor axis, and the problem of the asteroidal belt and the law of distribution of apsidal lines. Results should contribute to information about dust particles emanating from the moon, orbits of moon satellites, and space navigation and communication.

G. H. Conant, Jr., began an analysis of techniques of numerical integration of orbits to determine the nature of error "buildup" as a function of time, and possibly to devise new methods for minimizing this factor. The program has special pertinence to satellite and lunar-probe research.

Dr. Mario D. Grossi studied the effect of the ionosphere, the Van Allen belts, and the earth's magnetic field on radio-astronomical observations in MF and HF bands. Using the Hamiltonian ray-tracing for his analysis, he has written a program for computation on IBM–7090. He has demonstrated the existence of a continuous series of focal regions produced by the earth's ionosphere and has applied his results with some success to the problem of Jovian decameter radio bursts.

Imre G. Izsak, seeking increased accuracy of geodetic data derived from satellite observations, devised a modification of differential orbit improvement using residuals of observations along the orbit and in the normal direction to it with different, empirically determined weights. He constructed a precise theory of the critical inclination for more adequate knowledge of satellite motion. He also developed a computer program to make satellite orbits with very small eccentricities useful for the determination of odd zonal harmonics. Using precisely reduced Baker-Nunn satellite observation, he finds coefficients with 0.5 percent standard error, which is the highest accuracy achieved yet. For his continuing research into the tesseral harmonics of the geopotential, he is developing a computer program more satisfactory than that provided by an earlier method. In collaboration with Dr. Michael P. Barnett of Massachusetts Institute of Technology, he is also working on the application of computers to the analytical development of the planetary disturbing function in the restricted problem of three bodies.

Dr. Luigi G. Jacchia has concluded a significant portion of his study of atmospheric drag on artificial satellites, at present the only reliable source of information on atmospheric densities above 200 km. His analysis confirms the theory of the semiannual effect of interaction between the solar wind and the upper atmosphere, its amplitude varying with the 11-year solar cycle; reveals the influence of geomagnetic perturbations on the temperature of the upper atmosphere; provides correlations between atmospheric temperatures and the solar

flux at diametric wavelength, as well as the position of the sun with respect to the zenith; and makes possible prediction of atmospheric temperatures and densities as a function of solar-activity parameters. In continuing this program, which has already made such important contributions, he will concentrate especially on atmospheric structure. Jack Slowey has been closely associated with Dr. Jacchia in these investigations.

Dr. Yoshihide Kozai, on the basis of recently determined data from artificial satellites and other celestial bodies, proceeds with his investigations of astronomical constants. From his research into the geodetic uses of artificial satellites, he has recently prepared reports on results for the tesseral harmonics of the earth's gravitational field, on his second-order theory of oblateness perturbations, and on his redeterminations of coefficients of zonal spherical harmonics to the ninth order, derived from analysis of Baker-Nunn observations of 13 satellites. Dr. Kozai has also begun a new program to investigate secular perturbations of asteroids for information on high inclination and high eccentric orbits, a problem involving the stability theory of asteroids and of the solar system.

Dr. Don A. Lautman's study of the distribution of the perihelia of the asteroids attempts to determine a possible relationship with effects of second-order secular perturbations by Jupiter. His continuing numerical integration project to explore possible use of radiation pressure on balloon satellites as a means of achieving orbits around the moon has resulted in several computer programs which he will utilize for this purpose and for the study of other orbital problems awaiting investigation.

Dr. G. Veis continued his work in the geodetic uses of satellites from a geometric point of view. He is developing a program to use almost simultaneous observations for space triangulations and for absolute orientation in space of triangulation nets. He is currently attempting to determine the position of the 12 Baker-Nunn cameras by using the newest precisely reduced Baker-Nunn observations.

Satellite-tracking program.—The optical tracking of artificial satellites with NASA support continues to furnish important data for the prediction of orbits, determination of atmospheric densities, and geophysical and geodetic information. The program embraces a worldwide organization of 92 Moonwatch teams composed of nonprofessional observers and 12 precision photographic stations in various parts of the world, photographic image-reduction, detailed analysis by electronic computers, precise reduction of satellite positions, and calculation of satellite ephemerides.

From May 1, 1961, to May 1, 1962, visual observations by Moonwatch of 75 objects (satellites and their orbiting components) totaled

12,073, furnishing basic data for correcting ephemerides and for acquiring and reacquiring nonbroadcasting satellites. During the year the teams conducted a number of searches for orbiting objects.

In the same period the Computations Division distributed to the 12 Baker-Nunn stations 73,466 predictions that yielded 26,446 observations reported by cable to Cambridge. This amounts to approximately twice the activity of the previous year.

The Photoreduction Center received 25,060 successful films (arcs) and completed 15,409 reductions of satellite positions.

Through the Communications Center, 1.5 to 2 million words were cleared each month, 95 percent of these representing satellite data received or sent throughout the world. This compares with approximately 1 million words per month in the previous year.

The Research and Analysis Division has derived valuable conclusions based on the data drawn from the several tracking activities (see *Space Science*). For example, the variations of density in the high atmosphere for altitudes of 200 to 750 km. have been determined with respect to solar activity, ultraviolet and corpuscular radiation. The data on atmospheric drag obtained by optical observation are now used as basic information by most investigators in the field of atmospheric studies.

The geodetic applications of satellite observations continue to be studied. Knowledge of station coordinates has been improved by means of a program of simultaneous satellite observations from selected stations. The Baker-Nunn stations are now well equipped for this type of observation, and a prediction program for simultaneous observations is working satisfactorily. Good results have been obtained already from the stations in Peru and Argentina working simultaneously.

To further this work, studies are being conducted of the adaptability of modified aerial reconnaissance cameras for use as semimobile cameras for geodetic use, both independently and in conjunction with the fixed-position Baker-Nunn network. The Observatory is cooperating with the Department of Defense and NASA in establishing an international program for a flashing-light geodetic satellite.

Following a decision to continue operations of the optical satellite tracking program for a number of years, steps are being taken to do major maintenance and overhaul work on the cameras.

This work is complicated by the fact that facilities for handling the optical components of the cameras do not exist in most of the countries where the cameras are located.

PUBLICATIONS

Publications of the Smithsonian Contributions to Astrophysics included numbers 9 through 11 of volume 5.

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

AVRETT, E. H. Particle motion in the equatorial plane of a dipole magnetic field. Journ. Geophys. Res., vol. 67, pp. 53–58, 1962.

CARRIER, G. F., and AVRETT, E. H. A non-gray radiative-transfer problem. Astrophys. Journ., vol. 134, pp. 469–481, 1961.

COLOMBO, G. Instability of motion at the Lagrangian triangular point in the earth-moon system. Nature, vol. 193, p. 1063, 1962.

COOK, A. F.; HAWKINS, G. S.; and STIENON, F. M. Meteor trail widths. Astron. Journ., vol. 67, pp. 158–162, 1962.

DAVIS, R., and GODFREDSON, E. A. Optimum resolving power for an ultraviolet space telescope. Planet. Space Sci., vol. 5, pp. 207–212, 1961.

DAVIS, R. J., and RUSTGI, O. P. Ultraviolet instrumentation for Celescope—an astrophysical reconnaissance satellite. Applied Optics, vol. 1, pp. 131–137, 1962.

FIREMAN, E. L. The Ehole meteorite, its acquisition and its radioactivity. Journ. Geophys. Res., vol. 67, pp. 2592–2594, 1962.

FIREMAN, E. L., and DE FELICE, J. Argon-39, argon-37, and tritium in the recently fallen Bruderheim meteorite (abstract). Journ. Geophys. Res., vol. 66, p. 2528, 1961.

———. Tritium, argon-37, and argon-39 in the Bruderheim meteorite. Journ. Geophys. Res., vol. 66, pp. 3547–3551, 1961.

FIREMAN, E. L.; DE FELICE, J.; and TILLES, D. Solar flare tritium in a recovered satellite. Phys. Rev., vol. 123, pp. 1935–1938, 1961.

FIREMAN, E. L., and FISHER, D. E. Uranium in the Sikhote-Alin meteorite and its relation to the lead method of age determination. Nature, vol. 192, pp. 644–645, 1961.

FIREMAN, E. L., and ROWLAND, F. S. An additional measurement of the tritium contents of atmospheric hydrogen of 1949. Journ. Geophys. Res., vol. 66, p. 4321, 1961.

GINGERICH, O. Polynomial approximation for the negative hydrogen-ion absorption coefficient. Astrophys. Journ., vol. 134, pp. 653–656, 1961.

———. A computer program for non-gray stellar atmospheres (abstract). Astron. Journ., vol. 66, p. 285, 1961.

GOLDBERG, L. Project West Ford—properties and analysis. Introduction. Astron. Journ., vol. 66, pp. 105–106, 1961.

———. Solar experiments—U.S. plans. Mém. Soc. Roy. Sci. Liège, ser. 5, vol. 55, pp. 30–38, 1961.

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

———. Studying the universe from a space platform. *In* S. Ramo, ed., Peacetime uses of outer space, McGraw-Hill Book Co., New York, 1961.

———. Report of Commission 12 on radiation and structure of the solar atmosphere. *In* D. H. Sadler, ed., Trans. Intern. Astron. Union, Reports on astronomy, vol. XIA, pp. 63–89, Academic Press, New York, 1962.

GOLDBERG, L., and DYER, E. R., Jr. The Sun. *In* L. V. Berkner and H. Odishaw, ed., Science in space, pp. 307–340, McGraw-Hill Book Co., New York, 1961.

———. Galactic and extragalactic astronomy. *In* L. V. Berkner and H. Odishaw, ed., Science in space, pp. 341–399, McGraw-Hill Book Co., New York, 1961.

GROSSI, M. D.; STROM, K. M.; and STROM, S. E. Ionospheric focusing of cosmic radio sources. Journ. Geophys. Res., vol. 67, pp. 1672–1674, 1962.

HAGIHARA, Y. Rotation of an earth satellite in flight along its orbit. Smithsonian Contr. Astrophys., vol. 5, No. 9, pp. 113–143, 1961.

HODGE, P. W. Sampling dust from the stratosphere. Smithsonian Contr. Astrophys., vol. 5, No. 10, pp. 145–152, 1961.

IZSAK, I. G. A determination of the ellipticity of the earth's equator from the motion of two satellites. Astron. Journ., vol. 66, pp. 226–229, 1961.

———. A determination of the ellipticity of the earth's equator from the motion of two satellites. *In* H. C. van de Hulst, C. de Jager, and A. F. Moore, ed., Space Research II, pp. 352–359, North Holland Publishing Co., Amsterdam, 1961.

IZSAK, I. G., and KOZAI, Y. Equipotential surfaces of the earth as obtained from satellite motions (abstract). Journ. Geophys. Res., vol. 66, pp. 2538–2539, 1961.

JACCHIA, L. G. Irregularities in atmospheric densities deduced from satellite observations. Ann. Géophys., vol. 17, pp. 52–55, 1961.

———. A working model for the upper atmosphere. Nature, vol. 192, pp. 1147–1148, 1961.

———. Satellite drag during the events of November 1960. *In* H. C. van de Hulst, C. de Jager, and A. F. Moore, ed., Space Research II, pp. 747–750, North Holland Publishing Co., Amsterdam, 1961.

———. Interplanetary matter. *In* H. H. Koelle, ed., Handbook of astronautical engineering, pp. 2.57–2.64, McGraw-Hill Book Co., New York, 1961.

KOZAI, Y. Tesseral harmonics of the gravitational potential of the earth as derived from satellite motions. Astron. Journ., vol. 66, pp. 355–358, 1961.

———. Potential field of the earth derived from motions of artificial satellites. *In* S. H. Laurila and W. A. Heiskanen, ed., Proc. Symposium of Geodesy in the Space Age, pp. 174–176, Ohio State University, Inst. Geodesy, Photogrammetry, and Cartography, Publ. No. 15, 1961.

KUMAR, S. S. A method for computing monochromatic fluxes in model stellar atmospheres (abstract). Astron. Journ., vol. 66, pp. 288–289, 1961.

———. On the age of the galaxy. Observatory, vol. 82, pp. 34–36, 1962.

———. On the Λ and Φ operators of radiative transfer theory. Smithsonian Contr. Astrophys., vol. 5, No. 11, pp. 153–185, 1962.

LASSOVSZKY, K. On the accuracy of the measurements made upon films photographed by Baker-Nunn satellite tracking cameras (abstract). Astron. Journ., vol. 66, p. 289, 1961.

LEDOUX, P., and WHITNEY, C. A. Velocity fields and associated thermodynamic variations in the external layers of intrinsic variable stars. *In* R. N. Thomas, ed., Aerodynamic phenomena in stellar atmospheres, Proc. 4th Symposium on Cosmical Gas Dynamics, I.A.U. Symposium No. 12, pp. 131–193, Nuovo Cimento Suppl., ser. 10, vol. 22, No. 1, 1961.

MITLER, H. E. Electromagnetic potentials in quantum mechanics. Phys. Rev., vol. 124, pp. 940–944, 1961.

SKALAFURIS, A., and WHITNEY, C. A. Radiative cooling behind shock fronts in stellar atmospheres. Ann. d'Astrophys., vol. 24, pp. 420–424, 1961.

SOUTHWORTH, R. B. Planetary perturbations and the Perseid meteor stream (abstract). Astron. Journ., vol. 66, pp. 295–296, 1961.

STROM, S. E., and STROM, K. M. A possible mechanism for Jovian decameter bursts (abstract). Astron. Journ., vol. 67, p. 121, 1962.

TILLES, D. Variations of silicon isotope ratios in a zoned pegmatite. Journ. Geophys. Res., vol. 66, pp. 3015–3020, 1961.

———. Natural variations in isotopic abundances of silicon. Journ. Geophys. Res., vol. 66, pp. 3003–3013, 1961.

———. Primordial gas in the Washington County meteorite. Journ. Geophys. Res., vol. 67, pp. 1687–1689, 1962.

VEIS, G., and WHIPPLE, F. L. Experience in precision optical tracking of satellite for geodesy. *In* H. C. van de Hulst, C. de Jager, and A. F. Moore, ed., Space Research II, pp. 17–33, North Holland Publishing Co., Amsterdam, 1961.

WHIPPLE, F. L. Dust halo. Space World, vol. 1, No. 8, pp. 20 ff, 1961.

———. Problems of the cometary nucleus. Astron. Journ. vol. 66, pp. 375–380, 1961.

———. On the distribution of semimajor axes among comet orbits. Astron. Journ., vol. 67, pp. 1–9, 1962.

———. Report of Sub-commission 22a on meteorites. *In* D. H. Sadler, ed., Trans. Intern. Astron. Union, Reports on astronomy, vol. XIA, pp. 213–227, Academic Press, New York, 1962.

WHITNEY, C. A. Determination of atmospheric densities from satellite observations. Ann. Géophys., vol. 17, pp. 237–244, 1961.

WOOD, J. A. Chondrules and the origin of the terrestrial planets. Nature, vol. 194, pp. 127–130, 1962.

ZADUNAISKY, P. E.; SHAPIRO, I. I.; and JONES, H. M. Solar radiation pressure effects, gas leakage rates, and air densities inferred from the orbit of Echo I. *In* H. C. van de Hulst, C. de Jager, and A. F. Moore, ed., Space Research II, pp. 339–351, North Holland Publishing Co., Amsterdam, 1961.

The Special Reports of the Astrophysical Observatory distribute catalogs of satellite observations, orbital data, and preliminary results of data analysis prior to journal publication. Thirty-five numbers (64 through 98), issued during the year, contain the following material:

Special Report No. 64, July 7, 1961.

The revised orbit of Satellite 1958 Zeta, by R. C. Nigam.

Special Report No. 65, July 14, 1961.

Atmospheric drag on non-spherical artificial satellites, by P. E. Zadunaisky.

Special Report No. 66 (C–22), July 17, 1961.

Catalogue of satellite observations: Satellites 1958 Alpha (Explorer I), 1958 $\beta 1$ (carrier rocket, Vanguard I), 1958 Epsilon (Explorer IV), 1959 $\alpha 1$ (Vanguard II), 1959 $\alpha 2$ (carrier rocket, Vanguard II), 1959 Eta Vanguard III), and 1959 $\iota 1$ (Explorer VII), for Sept. 1–Dec. 31, 1960, by D. V. Mechau.

Special Report No. 67 (C–23), July 17, 1961.

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

Special Report No. 68 (C–24), July 17, 1961.

Catalogue of satellite observations: Satellites 1960 $\beta 1$ (carrier rocket, Tiros I), for Sept. 14–21, 1960; 1960 $\beta 2$ (Tiros I), for Sept. 2–Oct. 15, 1960; 1960 $\gamma 1$ (carrier rocket, Transit 1B), for July 7–27, 1960; 1960 $\gamma 2$ (Transit 1B), for July 26–Nov. 7, 1960; 1960 $\eta 1$ (Transit 2A), for June 26–Dec. 29, 1960; 1960 $\eta 2$ (Greb), for June 22–Dec. 23, 1960; 1960 $\eta 3$ (carrier rocket, Transit 2A, Greb), for June 23–Dec. 31, 1960; 1960 $\xi 1$ (Explorer VIII), for Nov. 4–Dec. 30, 1960; 1960 $\xi 2$ (carrier rocket, Explorer VIII), for Nov. 19–Dec. 24, 1960; 1960 Omicron (Discoverer XVII), for Nov. 13–Dec. 31, 1960; and 1960 Sigma (Discoverer XVIII), for Dec. 8–31, 1960, by D. V. Mechau.

Special Report No. 69, July 17, 1961.

List of coordinates of stations engaged in the observation of artificial earth satellites, by D. V. Mechau.

Special Report No. 70, July 18, 1961.
The motion of Satellite 1958 Epsilon around its center of mass, by G. Colombo.
Special Report No. 71, July 24, 1961.
Elements of the orbit of the Satellite 1959 Eta (Vanguard III) during the first year after launching, by P. E. Zadunaisky and B. Miller.
Special Report No. 72, August 9, 1961.
Tesseral harmonics of the potential of the earth as derived from satellite motions, by Y. Kozai.
Special Report No. 73, August 10, 1961.
Differential orbit improvement with the use of rotated residuals, by I. G. Izsak.
Special Report No. 74, September 18, 1961.
On the accuracy of measurements made upon films photographed by Baker-Nunn satellite tracking cameras, by K. Lassovszky.
Special Report No. 75, September 19, 1961.
Density of the heterosphere related to temperature, by M. Nicolet.
Special Report (unnumbered), September 20, 1961.
Index to SAO Special Reports Nos. 1–75.
Special Report No. 76, October 2, 1961.
Effects of the earth's ionosphere on HF radio astronomy from artificial satellites, by M. D. Grossi, K. M. Strom, and S. E. Strom.
Special Report No. 77, October 24, 1961.
Short-periodic oscillations in the drag of Satellite 1958 Alpha, by L. G. Jacchia and J. Slowey.
Special Report No. 78, October 25, 1961.
Satellite orbital data: Satellites 1958 Alpha, 1958 β1 and 1959 ι1 by B. Miller, for May–Dec. 1960, compiled by D. V. Mechau.
Special Report No. 79, October 30, 1961.
The analysis of gravity, by H. Jeffreys.
Special Report No. 80, November 1, 1961.
The stabilization of an artificial satellite at the inferior conjunction point of the earth-moon system, by G. Colombo.
Special Report No. 81, November 24, 1961.
The orbits of the Satellites 1959 α1 and 1959 α2 and the perturbations on the perigee distance of 1959 α1, by R. C. Nigam.
Special Report No. 82 (P–1), November 30, 1961.
Catalog of precisely reduced observations: Satellites 1959 α1, for Feb. 17–June 30, 1959; and 1959 Eta, for Sept. 18–Dec. 31, 1959, prepared by G. Veis.
Special Report No. 83, January 31, 1962.
Project Celescope, by R. J. Davis and Celescope staff.
Special Report No. 84, February 9, 1962.
Preliminary analysis of the atmospheric drag of the twelve-foot balloon satellite (1961 δ1), by L. G. Jacchia and J. Slowey.
Special Report No. 85 (P–2), February 12, 1962.
Catalog of precisely reduced observations: Satellites 1959 α1, for July 1–Dec. 31, 1959; 1959 α2, for Mar. 6–May 31, 1959; 1960 ζ2, for Sept. 10–Dec. 31, 1960; 1960 Omicron, for Nov. 13–Nov. 16, 1960; and 1960 Sigma, for Dec. 8–Dec. 10, 1960, prepared by G. Veis.
Special Report No. 86, February 21, 1962.
Satellite orbital data: Satellites 1958 Alpha, for Jan. 1–July 1, 1961; 1958 β1, for Jan. 1–July 27, 1961; 1960 ξ1, for Nov. 4, 1960–July 3, 1961; 1961 δ1, for Feb. 16–July 2, 1961; and 1961 ν1, for April 28–Sept. 1, 1961, by B.

Special Report No. 86, February 21, 1962—Continued
Miller; and 1959 ι1, for Dec. 31, 1960–July 1, 1961, by J. Weingarten, compiled by I. G. Izsak.

Special Report No. 87 (C–25), February 23, 1962.
Catalogue of satellite observations: Satellites 1958 Alpha (Explorer I), 1958 β1 (carrier rocket, Vanguard I), 1959 1 (Vanguard II), 1959 α2 (carrier rocket, Vanguard II), 1959 Eta (Vanguard III), and 1959 ι1 (Explorer VII), for Jan. 1–June 30, 1961, by D. V. Mechau.

Special Report No. 88 (C–26), February 23, 1962.
Catalogue of satellite observations: Satellites 1960 ι1 (Echo I) and 1960 ι2 (carrier rocket, Echo I), for Jan. 1–June 30, 1961, by D. V. Mechau.

Special Report No. 89 (C–27), February 23, 1962.
Catalogue of satellite observations: Satellites 1960 ξ1 (Explorer VIII), for Nov. 3, 1960–June 30, 1961; 1961 δ1 (Explorer IX), for Feb. 16–June 30, 1961; and 1961 η1 (Explorer XI), for April 27–June 30, 1961, by D. V. Mechau.

Special Report No. 90, Mar. 14, 1962.
On the critical inclination in satellite theory, by I. G. Izsak.

Special Report No. 91 (P–3), April 20, 1962.
Catalog of precisely reduced observations: Satellites 1958 δ2, for Dec. 1–17, 1958; 1959 α2, for Jan. 1–Dec. 31, 1960; and 1959 Eta, for Jan. 1–June 30, 1960.

Special Report No. 92 (E–1), April 23, 1962.
Satellite orbital data: Satellites 1958 δ2, for Dec. 7–14, 1959, by Y. Kozai; 1959 α1, for Feb. 21–Dec. 30, 1959, by P. Stern and M. Gutierrez; 1959 α2, for Mar. 19–May 28, 1959, by P. Stern; 1959 Eta, for Sept. 23–Dec. 30, 1959, by R. Nigam and P. Stern; 1960 ι2, for Sept. 11, 1960–Mar. 12, 1961, by I. Izsak and J. Weingarten; 1960 Omicron, for Nov. 13–15, 1960, by J. Weingarten; and 1960 Sigma, for Dec. 8–10, 1960, by J. Weingarten, compiled by I. G. Izsak.

Special Report No. 93, May 4, 1962.
Satellite orbital data: Satellites 1958 Alpha, for July 1, 1961–Jan. 1, 1962, by B. Miller; 1959 ι1, for July 1, 1961–Jan. 1, 1962, by M. Gutierrez; 1960 ξ1, for July 1, 1961–Jan. 1, 1962, by M. Hall; and 1961 δ1, for July 2, 1961–Jan. 5, 1962, by J. Weingarten, compiled by I. G. Izsak.

Special Report No. 94, May 23, 1962.
On the motion of Explorer XI around its center of mass, by G. Colombo.

Special Report No. 95 (P–4), June 18, 1962.
Catalog of precisely reduced observations: Satellites 1959 Eta, for July 1–Dec. 31, 1960; and 1960 ι2, for Jan. 1–June 30, 1961, prepared by K. Haramundanis.

Special Report No. 96 (C–28), June 25, 1962.
Catalogue of satellite observations: Satellites 1958 Alpha (Explorer I), 1959 α1 (Vanguard II), 1959 Eta (Vanguard III), and 1959 ι1 (Explorer VII), for July 1–Dec. 31, 1961; and 1959 α2 (carrier rocket, Vanguard II), for July 1–27, 1961, by B. Miller.

Special Report No. 97 (C–29), June 25, 1962.
Catalogue of satellite observations: Satellites 1960 ι1 (Echo I) and 1960 ι2 (carrier rocket, Echo I), for July 1–Dec. 31, 1961, by B. Miller.

Special Report No. 98 (C–30), June 25, 1962.
Catalogue of Satellite observations: Satellites ξ1 (Explorer VIII) and 1961 δ1 (Explorer IX), for July 1–Dec. 31, 1961; ρ1 (Explorer XI), for July 1–Sept. 28, 1961; and 1961 o1 (Transit 4a) and 1961 o2 (Injun Solar Radiation), for June 29–Dec. 31, 1961, by B. Miller.

OTHER ACTIVITIES

The director and Drs. Gingerich, Goldberg, Jacchia, Kozai, and Lassovszky attended the International Astronomical Union meeting in Berkeley, Calif. Mr. Izsak addressed the Space Science Symposium at Pasadena, Calif.

In August 1961, more than 50 scientists from 9 different countries attended the International Symposium on the Astronomy and Physics of Meteors held at the Observatory headquarters, Cambridge, Mass. The director, Dr. Hawkins, Dr. McCrosky, Dr. Southworth, and Mr. Briggs presented papers at the meeting. Drs. Fireman, Hamid, Jacchia, Wright, and Cook also attended. The proceedings of the symposium will be published in the Smithsonian Contributions to Astrophysics.

Dr. Whipple addressed the American Rocket Society meeting in New York on the concentration of dust around the earth.

Sir Harold Jeffreys delivered a series of 24 public lectures on figures of the earth and moon. He also lectured at the Institute of Geodesy at the University of Ohio.

Dr. Whipple represented the International Astronomical Union at a meeting of the International Academy of Astronautics and the Twelfth International Astronautical Congress in Washington, D.C. He also attended the U.S. Air Force's North American Air Defense Command Optical Space Science Conference in Colorado Springs, Colo.

Dr. Southworth presented a paper at a meeting on the exploration of the solar system by radar and radio-astronomy at the International Astronautical Congress in Washington, D.C.

Dr. Kozai attended the USSR conference on Theoretical Astronomy in Moscow.

Dr. Tilles presented a paper "Tritium in Discoverer Satellites" at the National meeting of the American Geophysical Union at Los Angeles, Calif.

Dr. Davis and Mr. Strom attended the American Astronomical Society Meeting in Denver, Colo. Mr. Strom presented a paper at the meeting.

Dr. Whipple was awarded the American Astronautical Society's Space Flight Award for 1962 at the annual meeting of the Society in Washington, D.C. He was elected vice president of the Society for 1962. He also spoke before the Subcommittee on Patents of the House of Representatives Committee on Science and Astronautics. He appeared before the full committee and presented a paper urging removal of military secrecy from the planned flashing-light geodetic satellite "Project Anna."

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Dr. Davis presented a paper on Project Celescope to the Institute of Radio Engineers in Baltimore.

The director and Dr. Wood attended the National Aeronautics and Space Administration Institute of Space Studies Conference on "The Origin of the Solar System" in New York.

The Observatory, together with the Harvard College Observatory, were hosts to the 110th annual meeting of the American Astronomical Society. Drs. Whipple, Southworth, Fireman, Kozai, Gingerich, Whitney and Messrs. Briggs and Zadunaisky presented papers.

Dr. Kozai attended a symposium on Solar System Constants at the Rand Corporation, Santa Monica, Calif.

Mr. Hagge attended a meeting of Study Group VII, C.C.I.R., in Geneva, Switzerland, concerning the international distribution of standard frequency and time signals.

Drs. Whipple, Colombo, Fireman, Jacchia, Kozai, Lautman, Tilles, Wood, Veis, and Mr. Izsak contributed to the COSPAR Meeting in Washington.

Drs. Jacchia and Kozai attended the International Symposium on the Dynamics of Satellites in Paris, France.

Drs. Whipple and Goldberg were invited to attend the National Academy of Sciences, Space Science Board, summer study program at the State University of Iowa. The program was directed toward an examination of the scope and quality of the national space science program and its future objectives.

STAFF CHANGES

The following scientists joined the staff: Dr. Thomas Noonan, Dr. Henri Mitler, Dr. Ursula Marvin, Dr. Frances Wright, and Dr. Allan F. Cook. During this year Sir Harold Jeffreys, Dr. Marcel Nicolet, Dr. Salah Hamid, Dr. George Veis, and Dr. G. G. Cillié worked at the Observatory.

Dr. Karoly Lassovszky died on December 20, 1961.

As of June 30, 1962, 322 persons were employed at the Observatory.

DIVISION OF RADIATION AND ORGANISMS

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

The research program of the Division has been concerned with fundamental studies in the area of radiation biology with emphasis on developing systematic concepts of the metabolic mechanisms and responses of living organisms as influenced and regulated by radiation.

In the study of phototropic responses, the tropic response of *Phycomyces blakesleeanus* to unilateral broad band blue (400–500 mμ) light has been found to disappear at intensities greater than 1,300

$\mu w/cm^2$. The growth response also has been found to vanish for sporangiophores adapted at intensities greater than 1,300 $\mu w/cm^2$. As this intensity is approached, the growth rate becomes 30–50 percent higher than that observed for sporangiophores adapted in the normal range of intensities, and this increased rate is maintained for long periods of time (3 or more hours). However, the mechanism controlling the level of light sensitivity (the range adjustment mechanism) appears to function at any intensity and with the same time constant of about 4.0 minutes as in the normal range.

The bending rate in the normal range is about 5–7 degrees/minute for continuous unilateral stimuli given at 90° to the long axis of the sporangiophore. As the intensity approaches 1300 $\mu w/cm^2$, the bending rate decreases rapidly to zero. Apparently, the gradient across the cylindrical growing zone disappears, just as found previously for immersion oils with an index of refraction near 1.295. Whether this loss of a gradient is due to saturation of the light sensitive system or to bleaching of the photoreceptors is not yet known.

Preliminary action spectra, at 20 mμ intervals, for this disappearance of the tropic response have been completed and found to have very nearly the same wavelength dependence as observed previously in the normal range tropic response.

The dimensions of the cytoplasmic layer within the growing zone and adjacent regions of the sporangiophore have been measured under oil immersion. On the average, the cytoplasm occupies about 40 percent of the diameter from the sporangium to 1 mm below. In the growing zone itself it is about 25 percent of the diameter, and below the growing zone decreases to about 15 percent. The cytoplasm is continuously streaming while being observed, and its thickness fluctuates as much as 10 percent within a few minutes at any one point.

The growth promoting effect of cobalt in etiolated leaf tissue is independent of growth inhibition by 2,4-dinitrophenol, which uncouples oxidative phosphorylation. Cobalt does not raise the adenosine triphosphate (ATP) concentration of leaf tissue, but does prevent a decrease in ATP content in the presence of 2,4-dinitrophenol. In order to elucidate the role of cobalt, experiments were performed with isolated mitochondria, the subcellular organelles which are the sites of oxidative phosphorylation. The results showed that cobalt alone had no significant effect on respiration or phosphorylation. However, when mitochondria were exposed to both cobalt and 2,4-dinitrophenol, phosphorylative activity increased about 10 percent over that of the 2,4-dinitrophenol control. Mitochondria contain not only enzymes that synthesize ATP, but also enzymes that decompose ATP. Since the influence of cobalt on the synthesis of ATP was relatively small, the possibility of cobalt's influencing the enzymatic decomposition was

examined. The results of these experiments showed that cobalt inhibited the destruction of ATP. This effect was observed both in the presence and absence of 2,4-dinitrophenol. Thus, it is indicated that cobalt exerts its growth-promoting influence by inhibiting the activity of the enzyme ATPase.

Studies on light-dependent chloroplast maturation have been conducted, using chloramphenicol (antibiotic) to determine the participation of protein synthesis in the maturation process. Etiolated plants that have been treated with chloramphenicol do not develop photosynthetic activity when irradiated with white light. Synthesis of chlorophyll is markedly inhibited and cannot be altered by large changes in the intensity of irradiation. In contrast, other light-dependent responses such as leaf expansion, opening of the hypocotyl hook, and anthocyanin formation are not inhibited by the antibiotic.

Measurements of excitation of chlorophyll fluorescence in intact control and treated leaves show that chloramphenicol does not prevent development of the ability of carotenoid pigments to transfer energy to chlorophyll. Measurements of Hill reaction and photosynthetic phosphorylation of chloroplasts of treated and control leaves show that antibiotic prevents development of these photosynthetic activities. Light-dependent increase of the photosynthetic enzyme TPN-linked glyceraldehyde-phosphate dehydrogenase was inhibited by chloramphenicol but that of another, carboxydismutase, was not. Increase in leaf protein which is associated with chloroplast maturation was partially inhibited by chloramphenicol.

These results indicate that chloramphenicol prevents synthesis of substances necessary for dark reactions of photosynthesis. At least one of the substances lacking in treated leaves and necessary for photosynthesis is associated with chloroplasts. Inhibition of development of photosynthetic activity of leaves can be accounted for by the ability of chloramphenicol to inhibit protein synthesis in leaves.

The physiological basis for changes in sensitivity of maize chromosomes to X-rays during seed germination has been studied, using somatic mutation technics. X-ray damage was markedly enhanced by oxygen, i.e., plants grown from seeds irradiated under anoxia (helium) showed a two- to three-fold reduction in sector frequencies as compared to plants grown from seed irradiated in air. Oxygen enhancement, which was virtually nil for dry seed, attained its initial expression after 4–5 hours hydration. Irradiation in two atmospheres of pure oxygen, rather than in air, effected no increase in sector frequencies during these first 4–5 hours. Apparently, the "oxygen effect" is not influenced primarily by factors governing availability of oxygen to the embryo, but owes its inception to other biochemical or biophysical changes during this early period of germination.

Studies involving the reversal of red light induction by far-red radiation at 25° C. show that there must be a time delay interposed between red and far-red light treatments before maximum reversal can occur in hypocotyl hook of beans, in *Arabidopsis* seed germination, and in leaf disc expansion. Lettuce seed germination and reversal by far-red light at 25° C. does not require a time delay between light treatments to obtain maximum efficiency in reversal. However, when the experiments are conducted at 2° C., a requirement for a time delay between light treatments is manifested.

The influence of such exogenous and endogenous factors as substrate, age, ionizing radiation, and particularly the red, far-red photomorphogenic pigment system on the development of the chlorophyll-synthesizing mechanism in etiolated leaf tissue, have all been previously demonstrated in this laboratory. The apparent effect of the mediation of a photomorphogenic receptor on chlorophyll synthesis implies a radiant energy stimulation of biochemical systems associated with either pigment precursor synthesis and/or exo- or endoplastid enzyme systems, resulting in observable gross morphological proplastid changes.

Light-microscope examination of corn leaf tissue macerates have revealed both biochemical and morphological changes within the developing proplastid. In the dark-grown seedling, proplastids continue to enlarge slowly and accumulate considerable starch internally during the first several days of growth; a short pretreatment with white light, on the other hand, induces an observable degradation of accumulated starch, as well as considerable enlargement in proplastid size. These light-induced proplastid changes can be correlated with photomorphogenic leaf responses such as elongation and expansion.

PUBLICATIONS

PRICE, LEONARD, and KLEIN, WILLIAM H. Red, far-red response and chlorophyll synthesis. Plant Physiol., vol. 36, pp. 733–735, 1961.

SHROPSHIRE, WALTER, Jr. The lens effect and phototropism of *Phycomyces*. Journ. Gen. Physiol., vol. 45, pp. 949–958, 1962.

MARGULIES, MAURICE M. The effect of chloramphenicol on the light dependent development of seedlings of *Phaseolus vulgaris* var. Black Valentine, with particular reference to the development of photosynthetic activity. Plant Physiol., vol. 37, pp. 473–480, 1962.

OTHER ACTIVITIES

The division was represented during this year at various conferences of scientists and meetings of scientific societies. Drs. L. Loercher and W. H. Klein were invited participants in the Gordon Research Conferences on Biochemistry and Agriculture, Tilton, N.H.,

where Dr. Loercher presented a paper on "The Influence of Cobalt on Leaf Expansion and Yield of Oxidative Phosphorylation."

Attending the annual meetings of the American Institute of Biological Sciences in August 1961 at Purdue University were L. Price, M. Margulies, W. Shropshire, V. B. Elstad, W. H. Klein, L. Loercher, and J. L. Edwards. Included among the papers presented to the American Society of Plant Physiologists at these meetings were "The Effect of Red and Far-Red Radiant Energy and Delta Amino Levulinic Acid on the Lag Phase of Chlorophyll Synthesis in Bean Seedlings," by E. C. Sisler, W. H. Klein, and Rebecca Gettens; "The Mode of Action of Cobalt in the Expansion of Etiolated Leaf Tissue," by L. Loercher; "The Effect of Chloramphenicol on Chlorophyll Formation and on Development of Photosynthetic Activity," by M. Margulies; and "Negative Phototropism of *Phycomyces* Sporangiophores to Blue Light Stimuli," by W. Shropshire. Dr. Klein attended the Executive Committee sessions of the American Society of Plant Physiologists.

Also in August, J. H. Harrison attended the Seminar for Scientific Glassblowers held at the State University of New York. Mr. Harrison and A. H. Busch attended the 8th Annual Symposium of the American Vacuum Society held in October in Washington.

Dr. Klein was an invited participant in the Conference on Basic Mechanisms in Radiobiology, San Juan, P.R., sponsored by the Atomic Energy Commission in November.

Dr. Shropshire attended the annual meeting of the Biophysical Society in Washington in February 1962. In March Dr. Klein visited the University of Arizona at Tucson to consult with Dr. Paul Damon regarding carbon-dating facilities, and in April he studied newly developed carbon-dating technics at Radiochemistry, Inc., at Louisville, Ky.

In May 1962, Drs. R. Latterell and Klein attended the 10th Annual Meeting of the Radiation Research Society at Colorado Springs, Colo.

Dr. Shropshire visited Duke University and North Carolina State College in June to consult with university scientists in the Departments of Biophysics and Plant Physiology.

Also in June, Mr. Harrison and A. H. Busch attended the 7th Annual Symposium of the American Scientific Glassblowers Society, held in Washington, where Mr. Harrison participated as chairman of the workshop committee.

The installation of a radio-carbon dating laboratory has been accomplished, and the facility is expected to be operational by August 1962. Facilities have also been installed for research in the biochemistry and physiology of marine organisms.

Dr. Pieter J. A. L. de Lint joined the research staff as visiting plant physiologist from Wageningen, the Netherlands. Dr. Konstantinos Mitrakos also joined the Division as visiting physiologist and biochemist from the University of Thessalonika, Greece.

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, 1962:

SMITHSONIAN ART COMMISSION

The 39th annual meeting of the Smithsonian Art Commission was held in Washington on Tuesday, December 5, 1961. 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, Stow Wengenroth, Archibald G. Wenley, and Andrew Wyeth. James C. Bradley, Assistant Secretary; Theodore W. Taylor, Assistant to the Secretary of the Smithsonian Institution; and Thomas M. Beggs, Director, National Collection of Fine Arts, were also present.

The Commission recommended reappointment of Robert Woods Bliss, Wilmarth Lewis, Henry P. McIlhenny, and Ogden M. Pleissner for the usual 4-year period.

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.

Dr. Carmichael announced the gift from Mrs. Laura Dreyfus Barney of Barney Studio House, 2306 Massachusetts Avenue. One of its principal rooms is being redecorated at the suggestion of the donor to be used by the Smithsonian Institution for meetings and cultural events.

He informed the Commission that Congress had appropriated planning funds to provide detailed plans and specifications for the remodeling of the Patent Office Building, which is expected to be vacated by the Civil Service Commission in 1963 and ready for occupancy by the National Collection of Fine Arts and the National Portrait Gallery during 1965. Dr. Carmichael stated that bills concerning the National Portrait Gallery had passed the Senate and had been favorably reported out of committee in the House.

[An act "To provide for a National Portrait Gallery as a bureau of the Smithsonian Institution" (Public Law 87–443) was approved on April 27, 1962.]

Mr. Beggs reported briefly that plans for space distribution in the Patent Office Building at present allotted approximately 40 percent to the National Collection of Fine Arts, 40 percent to the National Portrait Gallery, and 20 percent to common services. He stated that the National Collection of Fine Arts was looking forward to utilizing the space for increasing its temporary exhibition program and for the expansion and proper display of permanent collections. Mr. Beggs pointed out the following sources from which the National Collection of Fine Arts receives its collections: purchases, such as those from the Ranger and Myer Funds; gifts and bequests from individuals; transfers from other Government agencies; and gifts of state.

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

Two bronzes, The Bear Tamer and Head of Kid, by Paul Bartlett, N.A. (1865–1925). Offered by Miss Mary Bowditch, Boston, Mass.

Bronze, Napoleon I (1769–1821) by Launt Thompson (1833–1894). Offered by Dr. Gifford B. Pinchot, Upperco, Md.

Oil, Mother (Annie Williams Gandy), by Thomas C. Eakins (1844–1916). Bequest of Mrs. Edward Pearson Rodman, through Miss Helen W. Gandy, Washington, D.C.

Oil, Portrait of Isaac Lea (1792–1886) by Bernhard Uhle (1848–1930). Offered by Mrs. Lea Hudson, New York City.

Watercolor, Hains Point by William H. Holmes (1846–1933). Offered by Lt. Col. C. W. Tazwell, Madeira Beach, Fla.

Andre Joseph Villard by David Boudon (active 1795–1797), miniature, watercolor on paper. Offered by Frederick W. Cron, Falls Church, Va.

Two subjects, Mary and Unidentified Gentleman, miniatures, watercolor on ivory, by Nina Nash Cron. Offered by Frederick W. Cron, Falls Church, Va.

Henry Smith by Undetermined Artist, miniature, watercolor on ivory. Offered by Mrs. Willis Adams, Arlington, Va.

Flemish tapestry, The Beheading of St. Paul. Offered by Mrs. Phillip Coffin, Hamilton, Mass.

The Commission recommended that decision concerning an Unidentified Portrait by Undetermined Artist, oil on panel, which was transferred from the Library of Congress, be deferred until next year.

THE CATHERINE WALDEN MYER FUND

The following miniatures, watercolor on ivory, were acquired from the fund established through the bequest of the late Catherine Walden Myer:

No. 127. William Thornton (1759–1828) by Robert Field (c. 1769–1819). Acquired from Miss Maude S. Gallup, Springfield, Vt.

No. 128. Portrait of a Lady attributed to John Cox Dillman Engleheart (1783–1862). Acquired from Mr. and Mrs. H. H. Rankin, Laurel, Md.

No. 129. Self Portrait by John Wesley Jarvis (1780–1839). Acquired from Mrs. Helen Moffatt Langdon, Alexandria, Va.

No. 130. Portrait of Mustian by E. Bossi. Acquired from Arthur J. Dettmers, Jr., Washington, D.C.

No. 131. J. Maitland attributed to Richard Cosway (1740–1821).

No. 132. S. Stone, attributed to John Wood Dodge (1807–1893).

No. 133. Man in Black Coat, White Stock by A. Galloway.

No. 134. Man in Brown Coat by Nathaniel Hone (1718–1821).

No. 135. Man in Dark Blue Coat by Mausion.

No. 136. Young Woman with Dark Hair by Andrew Plimer (1763–1837).

No. 137. Man with Black Hair, Blue Coat, by Undetermined Artist.

No. 138. Man with Powdered Wig, Blue Coat, by Undetermined Artist.

No. 139. Young Girl in White by Undetermined Artist.

Nos. 131 through 139 were acquired from Mrs. Hubert G. King, Washington, D.C.

WITHDRAWALS BY OWNERS

Silver sugar bowl and cream pitcher by William Thomson, lent October 25, 1951, were withdrawn by William Huntington on November 20, 1961.

ART WORKS LENT AND RETURNED

Institutions	*Loans*	*Loans returned*
Baltimore Museum of Art	1	1
Bureau of the Budget	2	2
Chrysler Art Museum, Provincetown, Mass	--	1
Council of Economic Advisers	1	--
Dallas Museum of Fine Arts	1	1
Defense, Department of	1	1
General Services Administration	1	--
GWETA (Educational TV Studio)	2	2
Health, Education, and Welfare, Department of	22	20
Indian Claims Commission	1	--
Interior, Department of the	1	1
Internal Revenue Service	1	4
Justice, Department of	--	10
Lincoln Museum	--	1
Municipal Court for the District of Columbia	1	1
National Gallery of Art	2	2
Naval Historical Foundation	1	1
Peru, Embassy of	1	1
Post Office Department	1	--
Smithsonian Institution	24	8
State, Department of	1	1
Supreme Court, United States	1	--
Treasury, Department of the	2	--
United States District Court for the District of Columbia	1	5
United States Information Agency	1	1
Virginia Museum of Fine Arts	--	1
The White House	1	2
Whitney, Gertrude Vanderbilt, Museum of Western Art	--	1
Williamsport (Pa.) Community Arts Festival	13	13
	84	81

SMITHSONIAN LENDING COLLECTION

The following were added to the lending collection December 5, 1961:

Bronze, Head of Cat, by Paul Bartlett, N.A. (1865–1925). Offered by Miss Mary O. Bowditch, Boston, Mass.

Ivory, Statue of Liberty, by Raman Sankar. Offered by the artist, Karala State, Trivandrum, India, through the Embassy of India.

Two oils, Circus People Resting and Side Show, Ticket Seller, by Bernice Cross (1912–). Transferred from the National Zoological Park.

Three oils, Trout Stream, Top of the Ridge, and The Alcantara, together with two watercolors, Cathedral Steps, Cicicastenango, and Castillo de Bagor, Gerona, by Albert Sheldon Pennoyer (1888–1957). Offered by the estate of Albert Sheldon Pennoyer through the executors.

Three oils, The Deserted House, The Happy House, and Little White House (Holland), by S. Seymour Thomas (1868–1956). Offered by Mrs. Jean Haskell, Los Angeles, Calif.

Five oils, Unidentified Man by M. Shramchenko (1909–), George Washington (1732–1799), by Undetermined Artist, Christopher Columbus (c. 1446 or 1451–1506) by Undetermined Artist, Undetermined Title, by M. Stolypin, and Undetermined Title by G. Villegas. Transferred from the Library of Congress.

Two soft crayon lithographs, Duchess Charlotte of Northumberland and Duke Hugh of Northumberland, by Undetermined Artist. Offered by Mr. and Mrs. J. M. Higgie, Durham, England.

Harold F. Cross restored the following paintings: Alice Barney in Brown and White by Troubetzkoy; Albert Clifford Barney by O. W. Roederstein; Child by P. L. J. DeConinck; Laura at 16 by Alice Pike Barney; and Angel by Undetermined Artist.

The White Stock by Alice Pike Barney was renovated by Istvan P. Pfeiffer.

ART WORKS LENT FROM LENDING COLLECTION

Institutions	*Loans*	*Loans returned*
District Court for the District of Columbia	3	--
Dutchess County Art Association, New York	11	11
Health, Education, and Welfare, Department of	20	20
Internal Revenue Service	--	1
Science Information Exchange	--	15
United States District Court for the District of Columbia	--	3
	34	50

ALICE PIKE BARNEY MEMORIAL FUND

Additions to the principal during the year amounting to $2,260.62 increased the total invested sums in the Alice Pike Barney Memorial Fund to $43,358.91.

THE HENRY WARD RANGER FUND

According to a provision of the Henry Ward Ranger bequest, that paintings purchased by the Council of the National Academy of Design from the fund provided by the bequest and assigned to American art institutions may be claimed during the 5-year period beginning

10 years after the death of the artist represented, the following paintings, recalled for action of the Smithsonian Art Commission at its meeting December 5, 1961, were returned for permanent accession by the institutions to which they had been assigned.

No. 34. Captain Taylor's Sister, by Ernest L. Ipsen, N.A. (1869–1951); purchased in 1923 for $2,000 and assigned to the Dallas Art Association, Dallas, Tex.

No. 60. Still Life, by Frank W. Benson, N.A. (1862–1951); purchased in 1926 for $10,000 and assigned to the California Palace of the Legion of Honor, San Francisco, Calif.

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*
246. Landscape, Bridgehampton, by Paul Resika (1928–).	St. Gregory College, Shawnee, Okla.
247. The Sleeping Porch, by Frank Furnham (1926–).	Smith College Museum of Art, Northampton, Mass.
248. Douarnenez, by Miriam Broudy (1905–).	Everhart Museum, Scranton, Pa.
249. Reflections, by Adolf Konrad (1915–).	Assignment pending.
250. Elements of Construction, by Robert W. Daley (1922–).	Indiana University, Bloomington, Ind.
251. City of Churches, by Zoltan Sepeshy (1898–).	Rhode Island School of Design, Providence, R.I.
252. Lake Erie Shore, by Werner Groshaus (1913–).	Davenport Municipal Art Gallery, Davenport, Iowa.
253. Thanksgiving, by Salvatore Lascari (1884–).	Bruce Museum, Greenwich, Conn.
254. High Pastures (watercolor), by Warren Baumgartner (1894–).	Assignment pending.
255. Housing Development (watercolor), by E. Ingersoll Maurice (Mrs.) (1901–).	University of Kansas, Lawrence, Kans.
256. Figures in the Sunlight (watercolor), by John E. Costigan (1888–).	Rochester Memorial Art Gallery, Rochester, N.Y.
257. Thaw (watercolor), by Robert W. Bode	T. L. Wright Art Center, Beloit College, Beloit, Wis.
258. The Fascination of Toledo (watercolor), by Carol M. Grant.	Assignment pending.
259. Walls of Georgetown (watercolor), by Ralph Avery (1906–).	Witte Memorial Museum, San Antonio, Tex.
260. Porlock Weir (watercolor), by Donald Teague (1897–).	Mills College, Oakland, Calif.
261. Turn Around (watercolor), by Ed Graves (1917–).	Assignment pending.
262. Story Teller (watercolor), by Frederick Wong (1929–).	Assignment pending.
263. Monday Morning (watercolor), by Herb Olsen (1905–).	Assignment pending.
264. Evening by the Seashore (watercolor), by Mong Q. Lee (1923–1960).	Des Moines Art Center, Des Moines, Iowa.

SMITHSONIAN TRAVELING EXHIBITION SERVICE

In addition to 108 exhibits held over from previous years as indicated below, 27 new shows were introduced. The total of 135 shows was circulated to 316 museums in the United States. Two exhibitions were prepared for circulation abroad.

EXHIBITS CONTINUED FROM PRIOR YEARS

1955–56: Chinese Ivories from the Collection of Sir Victor Sassoon.

1956–57: Japan II by Werner Bischof; and The World of Edward Weston.

1957–58: The American City in the 19th Century; Recent American Prints; Japanese Woodblock Prints; Theatrical Posters of the Gay Nineties; Contemporary Portuguese Architecture; Nylon Rug Designs; Burmese Embroideries; Japanese Dolls; Thai Painting; The Anatomy of Nature; Photographs of Sarawak; Glimpses of Switzerland; Drawings by European Children; Photographs of Angkor Wat; and Pup, Cub and Kitten.

1958–59: Advertising in 19th Century America; The Engravings of Pieter Brueghel the Elder; Charles Fenderich—Lithographer of American Statesmen: 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; Children's Paintings from India; and A Child Looks at the Museum.

1959–60: The Art of Seth Eastman; Contemporary Greek Painting; Early Drawings of 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; Story of American Glass; Bazaar Paintings from Calcutta; Gandhara Sculpture; Sardinian Crafts; Arctic Riviera; Photographs by Robert Capa I; Photographs by Robert Capa II; Outer Mongolia; Pagan; Portraits of Greatness; Contrasts; Paintings by Young Africans; Japan I; and Greek Costumes and Embroideries.

1960–61: Work by Torres Garcia; Three Swiss Painters; The Technique of Fresco Painting; Folk Painters of the Canadian West; Paintings by Ch'i Pai-Shih; Birds of Greenland; A Tribute to Grandma Moses; The America of Currier and Ives; View 1960; Drawings by Sculptors; The Graphic Art of Edvard Munch; German Color Prints; Eskimo Graphic Art; Civil War Drawings I; Civil War Drawings II; American Art Nouveau Posters; American Industry in the 19th Century; America on Stone; Designed in Okinawa; Okinawa—Continuing Traditions; Prints by Munakata; Contemporary Japanese Drawings; Japan: Design Today; The Spirit of the Japanese Print; Americans—A View from the East; Swiss Industrial Architecture; Contemporary Swedish Architecture; Mies van der Rohe; Irish Architecture of the Georgian Period; One Hundred Years of Colorado Architecture; Brasilia—A New Capital; Scenic Designers Offstage; Design in Germany Today; Fibers, Tools and Weaves; Designed for Silver; Batiks by Maud Rydin; American Textiles; The Seasons, color photographs by Eliot Porter; The World of Werner Bischof; The Image of Physics; Charles Darwin: The Evolution of an Evolutionist; The Beginnings of Flight; The Magnificent Enterprise—Education Opens the Door; The New Theatre in Germany; Tropical Africa I; Tropical Africa II; Symphony in Color; Paintings and Pastels by Children of Tokyo; Children's Art from Italy; Hawaiian Chil-

1960–61—Continued

dren's Art; Designs by Children of Ceylon; and Children's Paintings from Chile.

EXHIBITIONS INITIATED IN 1962

Archeology

Title	*Source*
Tutankhamun's Treasures	Department of Antiquities, United Arab Republic; United Arab Republic Embassy.

Paintings and Sculpture

14 Americans in France	American Cultural Center, Paris.
George Catlin, Paintings and Prints	Smithsonian Institution.
Physics and Painting	Index of American Design, National Gallery of Art.
UNESCO Watercolor Reproductions	UNESCO in Paris; Twentieth Century Fund.

Drawings and Prints

Belgian Drawings	Ministère de l'Instruction Publique; M. J. van Lerberghe; Belgian Embassy.
The Lithographs of Childe Hassam	Smithsonian Institution; National Gallery of Art; Boston Public Library; Carnegie Institute in Pittsburgh; Detroit Institute of Art; Philadelphia Museum of Art; and others.
Contemporary Italian Drawings	Traveling Exhibition Service, Smithsonian Institution.
John Baptist Jackson	Smithsonian Institution, Jacob Kainen; museums in the United States and abroad.
Contemporary Swedish Prints	National Museum; Galleri Brinken, Stockholm; E. Maurice Bloch, Curator, Grunwald Graphic Arts Foundation, UCLA Galleries.
Tiepolo Drawings	Victoria and Albert Museum, London; British Government.

Oriental

Japanese Posters	Collection of Library of Congress.
The Face of Viet Nam	Raymond Cauchetier, photographer, Paris.

Architecture

Architectural Photography (New Edition).	American Institute of Architects; Architectural Photographers Association.
Le Corbusier—Chapel at Ronchamp	American Institute of Architects.
The Family, The Neighborhood, The City.	United Neighborhood Houses; National Federation of Settlements and Neighborhood Centers.

Design and Crafts

Title	Source
100 Books from the Grabhorn Press	Edwin and Robert Grabhorn Collection, private owners.
Wisconsin Designer-Craftsmen	Milwaukee Art Center, Mrs. Meg Torbert; Wisconsin Designer-Craftsmen.

Photography

Caribbean Journey	Fritz Henle, photographer, New York City.
The Swedish Film	Swedish Institute, Stockholm, Dr. Tore Tallroth, Director; Embassy of Sweden.
The Story of a Winery	Paul Masson Vineyards; Ansel Adams and Pirkle Jones, photographers.

Science

This Is the American Earth	Sierra Club of San Francisco.
The Hidden World of Crystals	Merck Sharp & Dohme Research Laboratories.
Hummingbirds	American Museum of Natural History, New York City.

Children's Art

Brazilian Children's Art	Alvares Penteada Foundation, São Paulo; Escolinhas de Arts do Brazil, Rio de Janeiro; Brazilian Embassy.
Children Look at UNESCO	School Art League, New York; Commercial Museum, Philadelphia.
My Friends	Arts and Activities Magazine; Galerie St. Etienne.

STAFF ACTIVITIES

An increasing amount of staff time is devoted to reorganization and planning in preparation for removal to the Old Patent Office Building. Adaptation of NCFA collections and functions to the space allotted, certain areas of which must be shared jointly with the newly authorized National Portrait Gallery, demands much of the director's time. Recommendations of many features essential to modern gallery operation are required in the conversion of a historic structure erected a century ago. Assistance of the staff of the Smithsonian, especially in providing the services of consultants, Eugene Kingman for exhibition techniques, Dr. Anthony Garvan for historical research on the Old Patent Office Building, and Dr. Richard H. Howland for architectural character of interior design, has been much appreciated. Professional advice from construction specialists and staff members of the architectural firm of Faulkner, Kingsbury & Stenhouse, has been found most helpful. Guidance of the Public Buildings Service, General Services Administration, has been indispensable.

The renovation of the Natural History Building and the removal and rehanging of between 300 and 400 other items have required relocation of storage involving packing and shipping large canvases. This has been planned and removal operations accomplished with the aid of the buildings management department of the Institution. That department has also given the NCFA generous shop assistance in moving the A. P. Barney Lending Collection to new storage and has provided excellent cooperation, often at short notice, in the installation of foyer exhibits, such as Okinawa: Textiles and Traditions. The assistance of Mr. and Mrs. Istvan P. Pfeiffer was helpful in completing this special show. Keyes Porter has contracted to cross-index accessions and otherwise amplify the usefulness of cataloged information. Until illness prevented, George C. Groce was engaged in a study of the collections to determine most essential needs in future augmentation. The staff inventoried Barney Collection pictures on loan to Federal agencies, noting condition and obtaining information essential to the care of the collection.

In addition to the approximately 20,000 requests for information received by mail and telephone, inquiries made in person at the office numbered 1,600. In all, 189 works of art were examined by the director and curator.

Special catalogs were published for the following traveling exhibitions: Tutankhamun's Treasures; Tiepolo Drawings; Belgian Drawings; and Drawings by Sculptors. Informative folders were printed for traveling shows in the following categories: Natural History and Science; Oriental Art Exhibitions; History Exhibitions; Photography Exhibitions; and Children's Art Exhibitions. A special catalog of Traveling Exhibitions for 1962–63 was also published.

Contracts were let for the relining and restoring by Harold F. Cross of the following: Roses by Walter Shirlaw; Sheepyard, Moonlight, by H. L. Walker; Portrait of Dr. Stejneger by Bjorn Egeli; Brother and Sister by Abbott H. Thayer; Nymph and Water Babies at Play by William Baxter Closson; Angel by Abbott H. Thayer; Autumn by Bruce Crane; Rome and the Campagna by Richard Wilson; Visit to the Tomb of Washington by Thomas P. Rossiter; A Load of Brush by Louis Paul Dessar; 11 paintings by Edmund C. Tarbell entitled President Wilson, General George Leman, Mary Reading, Herbert Hoover, Self Portrait, Mr. Frick and Daughter Helen, Mrs. Tarbell as a Girl, Margery and Little Edmund, Marshal Foch, Roses in Blue Vase, and In the Orchard; and Mrs. Elizabeth Boucher attributed to John S. Copley.

Henri G. Courtais contracted for renovation of the following paintings: Self Portrait by Sir Thomas Lawrence; Archibald Skirving by Sir Henry Raeburn; Head of Old Man by Jose de Ribera; Mrs. Towry

by Sir Thomas Lawrence; Edmund Waller by Gerard van Soest (formerly attributed to Dobson); Marine by Richard Parkes Bonington; Virgin and Child by Bernard Van Orley; Ralph Cross Johnson by Ernest Moore; Duke of Sussex by Sir William Beechey; Canal Scene by Francesco Guardi; Water Scene by Francesco Guardi; Landscape by Thomas Barker; and Young Girl attributed to Drost.

SPECIAL EXHIBITIONS

July 1 through 23, 1961. Ninth Interservice Photography Contest, sponsored by the Armed Forces of the United States; consisted of photographs by members of the armed services.

July 29 through August 27, 1961. The Magnificent Enterprise: Education Opens the Door, sponsored by the Vassar Club of Washington, D.C., and circulated by the Smithsonian Traveling Exhibition Service; consisted of 200 photographs, engravings, lithographs, posters, and drawings.

September 8 through October 18, 1961. The Eighth International Exhibition of Ceramic Art, sponsored by the Kiln Club of Washington, D.C., and installed by the Division of Ceramics and Glass; consisted of 426 items, including 255 objects from the United States and 171 objects from 16 foreign countries. A catalog was privately printed.

October 21 through November 9, 1961. Sixty-eighth Annual Exhibition of the Society of Washington Artists, consisting of 74 paintings and 20 sculptures. A catalog was privately printed.

November 19 through December 7, 1961. Twenty-fourth Metropolitan Art Exhibition, sponsored by the American Art League; consisted of 134 paintings and 30 sculptures. A catalog was privately printed.

December 15, 1961, through January 7, 1962. Paintings by George Catlin, Artist and Historian of the American Indian; consisted of 115 items including 90 paintings (recently restored by Henri G. Courtais), 13 colored lithographs, 7 photographs, and 3 miniatures from the collections of the Smithsonian Institution, together with 2 photographs loaned by the Gilcrease Institute of American History and Art. A multilithed catalog was printed. (Thirty-five paintings and 12 lithographs from this exhibition were selected for circulation by the Smithsonian Traveling Exhibition Service.)

December 16, 1961, through January 7, 1962. Americans—A View from the East, circulated by the Smithsonian Traveling Exhibition Service; consisted of 42 Japanese woodblock prints.

January 14 through February 4, 1962. Twenty-fourth National Exhibition of the Society of Washington Printmakers; consisted of 165 prints. A catalog was privately printed.

January 14 through February 4, 1962. The Character of Korea, sponsored by the Embassy of Korea and circulated by the American-Korean Foundation; consisted of 55 photographs by Wallace C. Marley. An illustrated catalog and explanatory brochure were privately printed.

February 11 through March 4, 1962. An exhibition of the Ilke and Jacoby Lace Collection from St. Gall, Switzerland, sponsored by the Ambassador of Switzerland and circulated by the Swiss Fabric and Embroidery Center, New York City. An illustrated brochure was privately printed.

March 11 through 29, 1962. Sixty-fourth Annual National Exhibition of the Washington Water Color Association; consisted of 104 watercolors. A catalog was privately printed.

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March 29 through 31, 1962. An exhibition by Ikebana International, consisting of Japanese flower arrangements by Sofu Teshigahara.

April 8 through 29, 1962. Twenty-first Biennial Art Exhibition sponsored by the National League of American Pen Women; consisted of 74 items, including paintings, drawings, and graphic arts. A catalog was privately printed.

April 16 through 29, 1962. The Hidden World of Crystals, circulated by the Smithsonian Traveling Exhibition Service; consisted of 25 microphotographs of drugs and chemicals by Jack Kath of Merck Sharp & Dohme Research Laboratories.

May 6 through 27, 1962. Twenty-ninth Annual Exhibition of the Miniature Painters, Sculptors and Gravers Society of Washington, D.C.; consisted of 157 items. A catalog was privately printed.

May 5 through 27, 1962. Okinawa—Textiles & Traditions, under the auspices of the Cultural Properties Committee of the Government of the Ryukyu Islands and circulated by the Smithsonian Traveling Exhibition Service; consisted of 164 items, including scrolls, lacquer, ceramics, toys, inryo and netsuke, and textiles (kimonos, tisaji, furoshiki, fabric samples, and bolts). Oriental flower displays were arranged daily by members of Ikebana International.

May 5 through 27, 1962. Birds of Greenland, sponsored by the Ambassador of Denmark and Countess Knuth-Winterfeldt and circulated by the Smithsonian Traveling Exhibition Service; consisted of 52 watercolors by Gitz-Johansen and a book, The Birds of Greenland by Finn Salomonsen, containing reproductions of paintings by Gitz-Johansen. A brochure was privately printed.

June 3 through 21, 1962. Works of Government Artists sponsored by the Society of Federal Artists, consisted of 153 items.

June 3 through 24, 1962. An exhibition of color woodcuts by John Baptist Jackson (1701–1780), circulated by the Smithsonian Traveling Exhibition Service; consisted of 40 woodcuts and a book, *John Baptist Jackson: 18th Century Master of Color Woodcuts*, by Jacob Kainen, U.S. National Museum Bulletin 222.

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 42d annual report of the Freer Gallery of Art, for the year ended June 30, 1962.

Archibald Gibson Wenley, second director of the Freer Gallery of Art, died on February 17, 1962. He was born May 5, 1898, in Ann Arbor, Mich., and graduated from the University of Michigan in 1921, and the Library School of the New York Public Library in 1923. In that same year, Mr. Wenley joined the staff of the Freer Gallery as a trainee sinologist, and participated in the archeological surveys conducted in China under the joint sponsorship of the Museum of Fine Arts, Boston, and the Freer Gallery. He studied under Freer auspices in Paris for 3 years at the École des Langues Orientales Vivantes and the Institut des Hautes Études Chinoises; and in Kyoto, Japan, for 2 years.

Mr. Wenley formally joined the staff of the Freer Gallery in 1931 as associate in research. He possessed a firm foundation in the languages, history, and culture of China and Japan; and, when John Ellerton Lodge, the first director of the Freer Gallery, died in December 1942, Mr. Wenley was appointed as director. He served on numerous committees through the years, including the Smithsonian Art Commission; member of the Board of United States Civil Service Examiners at Washington, D.C., for the Smithsonian Institution; member, the Visiting Committee, Dumbarton Oaks Research Library and Collection; research professor of Oriental art, University of Michigan; trustee, Textile Museum of the District of Columbia; trustee, Hermitage Foundation, Norfolk, Va.; chairman of the Louise Wallace Hackney Scholarship Committee of the American Oriental Society; president, Cosmos Club; and chairman, American Committee for the Japanese Government Loan Exhibition, 1953.

Archibald Wenley was a distinguished scholar and was particularly known for his contributions to the study of archaic Chinese bronzes. He contributed articles and reviews to many journals, and in 1946, in collaboration with Dr. John A. Pope, who now succeeds him as director, published *A Descriptive and Illustrative Catalogue of Chinese Bronzes Acquired during the Administration of John Ellerton Lodge*. In 1943 he brought the Freer Fellowship program with the University of Michigan into reality and expanded the research facilities and publication programs of the Gallery. One result was the inauguration of the monograph series *Ars Orientalis*, a scholarly quarto journal of the arts of Islam and the East published jointly

by the Smithsonian and the university. Altogether, Mr. Wenley was associated with the Gallery for more than 30 years, and his constructive influence on the progress, growth, and administration of the organization will be felt for many years to come.

THE COLLECTIONS

Under the terms of paragraph 4 of the first codicil of the last will and testament of the late Charles Lang Freer, the following five objects were presented by Mrs. Eugene Meyer:

BRONZE

61.30. Chinese, Chou dynasty. *Tsun;* stylized dove; four gold characters on crest. Height: 0.265; length: 0.200; width: 0.135.

61.31. Chinese, Chou dynasty. *Yi* (or *i*); snake motif. Height: 0.205; length: 0.320; width: 0.177.

61.32. Chinese, Chou dynasty. *Hu;* inlaid with silver, and malachite. Damaged. Height: 0.526; width (with handles): 0.278; width: 0.255.

61.33. Chinese, Shang dynasty. *Kuang;* design incorporates many stylized birds and animals. No inscription. Height: 0.314; length: 0.313; width: 0.142.

PAINTING

61.34. Chinese, Sung (Chin) dynasty, late 12th or early 13th century, by Li Shan. "Wind and Snow in the Fir Pines." Ink and light colors on silk; signature, 1 inscription, and 25 seals on painting; label, 5 colophons, and 50 seals on mount. Makimono (painting): height 0.297; width: 0.792; (overall) height: 0.312; width: 10.032. (Illustrated.)

Twenty-seven objects were added to the collections by purchase as follows:

METALWORK

62.1. Persian, Sasanian, first half of 6th century A.D. Silver bowl partially gilt, showing King Kavadh I hunting ibex and gazelle. Dark purplish gray incrustation of silver chloride on silver background; traces of green copper corrosion products. Small breaks, with some pieces missing on lower left. Height: 0.024; diameter, 0.191. (Illustrated.)

PAINTING

62.14. Chinese, Ch'ing dynasty, 18th century, by Huang Shen (1687–after 1768). Old man gazing at branches of magnolia in a vase. Ink and light red-brown color on paper. Inscription and two seals of the artist on the painting. Height: 1.020; width: 0.400.

62.5. Chinese, Ch'ing dynasty, dated 1706, by Wang Yüan-chi (1642–1715). River landscape; in the manner of Huang Kung-wang. Ink and color on paper. Inscription and four seals of the artist on the painting, along with seven collectors' seals. Label, with one seal, on the reverse of the mounting. Kakemono: height: 0.977; width: 0.592.

62.4. Chinese, Ch'ing dynasty, dated 1704, by Wu Li (1632–1718). Landscape: "Streams and Mountains after Rain"; in the manner of Huang Kung-wang. Ink on paper. Inscription and three seals of the artist on the painting, along with three collectors' seals. Label on reverse of the mounting. Kakemono: height: 1.310; width: 0.310.

62.2. Japanese, Kamakura period, 14th century, Buddhist school. *Kako Genzai*

Ingakyō (Sutra of Cause and Effect). Ink and color on paper; fragment of a handscroll. Makimono: height: 0.269; width: 0.989.

62.3. Japanese, Kamakura period, 14th century, Yamatoe school. *Hōnen Shōnin Gyōjō Ezu* (Illustrated Deeds of the Priest Hōnen). Ink and color on paper; fragment of a handscroll. Makimono: height: 0.406; width: 0.727.

62.6–62.8. Japanese, Kamakura period, 14th century, Yamatoe school. Three illustrations from: *Shōtoku Taishi Eden* (An Illustrated History of Prince Shōtoku). "The Archery Contest," "The Flying Tiles," and "Shōtoku Taishi on Horseback." Ink and color on paper; fragments from a handscroll. Makimono: height: 0.347; average width: 0.460–0.505.

62.9. Japanese, Kamakura period, 14th century, Yamatoe school. *Kōnin Shōnin Eden* (An Illustrated Biography of the Priest Kōnin). Ink and color on paper; fragment from a handscroll. Makimono: height: 0.336; width: 0.559.

62.13. Japanese Namboku-chō period, late 14th century, Yamatoe school. Portrait of Prince Shōtoku (aged 14) as the Budhisattva Jizō. Ink and color on silk. Kakemono: height: 1.247; width: 0.689.

61.23–61.24. Japanese, Ashikaga period, Yamatoe school. A pair of illustrations from: *Geppōji Kenritsu Engi* (History of the Founding of the Geppōji Temple). Text by Kinnatsu; dated 1495. Ink, color and gold on paper. Makimono: height: 0.345; average width: 10.660–11.377.

62.19 Japanese, Edo period, Ukiyoe school, by Shorakusai (18th–19th century). Theatre scene from "The Tale of the Brothers Soga"; man and woman in snowy landscape. In color on paper. Makimono: height: 0.254; width: 0.520.

61.25 Japanese, Edo period, 18th century, Ukiyoe school, by Tsukioka Settei (1710–1786). "Woman with a Puppet." Ink, color and gold on paper. Kakemono: height: 0.989; width: 0.269. (Illustrated.)

62.10–62.12. Japanese, Edo period, early, Unkoku school, by Unkoku Tōnin (early 17th century). A set of three screens; Birds in Landscape. Ink, color and gold leaf; *fusuma* (sliding doors) now mounted as two-fold screens. Average: height: 1.605; width: 1.680.

POTTERY

61.27. Chinese, T'ang-Sung dynasty, "gray ware" of *yueh* type. Tall vase with slender neck and wide mouth; loops on shoulder; cover. Clay: hard gray porcellaneous stoneware. Glaze: clear. Decoration: none. Height: 0.326; diameter: 0.152.

62.17. Chinese, Ming dynasty, early 16th century. Dish with plain rim. Clay: fine white porcelain. Glaze: transparent, glossy. Decoration: dragons among lotus scrolls inside and out, painted in underglaze blue. Mark of four Mongolian (*Phags-pa*) characters in blue on base. Height: 0.047; diameter: 0.216.

62.16. Chinese, Ming dynasty, Chia-ching period (1522–1566). Vase of *kuan* shape. Clay: fine white porcelain. Glaze: transparent, glossy. Decoration: floral scrolls, and boys playing in a garden, painted in underglaze blue. Six-character Chia-ching mark in blue on base. Height: 0.267; diameter: 0.320.

62.20. Japanese, Momoyama period, *shino* ware. Dish on three feet, so-called "cake dish," with four-lobed, upturned rim. Clay: coarse buff-gray stoneware. Glaze: thick, bubbly, uneven, grayish. Decoration: plum blossom sprays in iron brown. Height: 0.055; diameter: 0.169.

61.26. Japanese, Edo period (1615–1867), *imari* ware. Jar of *kuan* shape. Clay: white porcelain. Glaze: clear, slightly bluish. Decoration: three plant groups in underglaze blue. Height: 0.237; diameter: 0.220.

62.15. Japanese, Edo period (late Genroku), *imari* ware. Dish with ten-lobed rim. Clay: white porcelain. Glaze: transparent. Decoration: paulonia and diaper pattern painted in underglaze blue, overglaze enamel colors and gold; waves and plum blossoms outside *Daikon* in blue on base. Height: 0.057; diameter: 0.343.

62.18. Japanese, Edo period (late Genroku), *imari* ware. Jar of globular form, with cover and small handle on top. Clay: white porcelain. Glaze: transparent. Decoration: floral patterns, roundels, and diaper patterns in underglaze blue and overglaze enamels and gold. *Daikon* in overglaze red and gold on base. Height: 0.140; diameter: 0.133.

61.29 Japanese, Edo period (1615–1867), Kakiemon ware. Deep bowl of decagonal shape with flaring rim and upturned lip. Clay: white porcelain. Glaze: clear. Decoration: hydrangeas and phoenixes in overglaze enamels; dragon in slip inside; brown rim. Height: 0.101; diameter: 0.210.

61.28. Japanese, Edo period (1615–1867), by Kenzan. Teabowl; round with smooth surface and finely cut thin foot; signed Kenzan. Box. Clay: fairly fine grained brownish buff stoneware. Glaze: clear, finely crackled. Decoration: pine trees with blue needles on ground of white slip, on one side inside, and on the other outside. Height: 0.066; diameter: 0.133. Box: height: 0.124; length: 0.161; width: 0.161.

REPAIRS TO THE COLLECTIONS

Thirty-two Chinese, Japanese, and Indian objects were restored, repaired, or remounted by T. Sugiura, Oriental picture mounter. F. A. Haentschke, illustrator, remounted 73 Indian, Persian, and Arabic paintings. Repairs and regilding of 16 frames for American paintings were done outside the Gallery.

CHANGES IN EXHIBITIONS

Changes in exhibitions amounted to 523, which were as follows:

American art:	
Oils	55
Prints	34
Chinese art:	
Bronze	29
Cloisonné	1
Ivory	4
Jade	40
Lacquer	3
Paintings	25
Pottery	50
Christian art:	
Crystal	2
Glass	6
Gold	20
Manuscripts	43
Stone sculpture	2
Japanese art:	
Gold	2
Lacquer	12
Paintings	66
Pottery	20
Sculpture	3
Near Eastern art:	
Bookbinding	5
Glass	6
Jade	2
Manuscripts	1
Metalwork	37
Paintings	20
Pottery	35

Ingakyō (Sutra of Cause and Effect). Ink and color on paper; fragment of a handscroll. Makimono: height: 0.269; width: 0.989.

62.3. Japanese, Kamakura period, 14th century, Yamatoe school. *Hōnen Shōnin Gyōjō Ezu* (Illustrated Deeds of the Priest Hōnen). Ink and color on paper; fragment of a handscroll. Makimono: height: 0.406; width: 0.727.

62.6–62.8. Japanese, Kamakura period, 14th century, Yamatoe school. Three illustrations from: *Shōtoku Taishi Eden* (An Illustrated History of Prince Shōtoku). "The Archery Contest," "The Flying Tiles," and "Shōtoku Taishi on Horseback." Ink and color on paper; fragments from a handscroll. Makimono: height: 0.347; average width: 0.460–0.505.

62.9. Japanese, Kamakura period, 14th century, Yamatoe school. *Kōnin Shōnin Eden* (An Illustrated Biography of the Priest Kōnin). Ink and color on paper; fragment from a handscroll. Makimono: height: 0.336; width: 0.559.

62.13. Japanese Namboku-chō period, late 14th century, Yamatoe school. Portrait of Prince Shōtoku (aged 14) as the Budhisattva Jizō. Ink and color on silk. Kakemono: height: 1.247; width: 0.689.

61.23–61.24. Japanese, Ashikaga period, Yamatoe school. A pair of illustrations from: *Geppōji Kenritsu Engi* (History of the Founding of the Geppōji Temple). Text by Kinnatsu; dated 1495. Ink, color and gold on paper. Makimono: height: 0.345; average width: 10.660–11.377.

62.19 Japanese, Edo period, Ukiyoe school, by Shorakusai (18th–19th century). Theatre scene from "The Tale of the Brothers Soga"; man and woman in snowy landscape. In color on paper. Makimono: height: 0.254; width: 0.520.

61.25 Japanese, Edo period, 18th century, Ukiyoe school, by Tsukioka Settei (1710–1786). "Woman with a Puppet." Ink, color and gold on paper. Kakemono: height: 0.989; width: 0.269. (Illustrated.)

62.10–6212. Japanese, Edo period, early, Unkoku school, by Unkoku Tōnin (early 17th century). A set of three screens; Birds in Landscape. Ink, color and gold leaf; *fusuma* (sliding doors) now mounted as two-fold screens. Average: height: 1.605; width: 1.680.

POTTERY

61.27. Chinese, T'ang-Sung dynasty, "gray ware" of *yueh* type. Tall vase with slender neck and wide mouth; loops on shoulder; cover. Clay: hard gray porcellaneous stoneware. Glaze: clear. Decoration: none. Height: 0.326; diameter: 0.152.

62.17. Chinese, Ming dynasty, early 16th century. Dish with plain rim. Clay: fine white porcelain. Glaze: transparent, glossy. Decoration: dragons among lotus scrolls inside and out, painted in underglaze blue. Mark of four Mongolian (*Phags-pa*) characters in blue on base. Height: 0.047; diameter: 0.216.

62.16. Chinese, Ming dynasty, Chia-ching period (1522–1566). Vase of *kuan* shape. Clay: fine white porcelain. Glaze: transparent, glossy. Decoration: floral scrolls, and boys playing in a garden, painted in underglaze blue. Six-character Chia-ching mark in blue on base. Height: 0.267; diameter: 0.320.

62.20. Japanese, Momoyama period, *shino* ware. Dish on three feet, so-called "cake dish," with four-lobed, upturned rim. Clay: coarse buff-gray stoneware. Glaze: thick, bubbly, uneven, grayish. Decoration: plum blossom sprays in iron brown. Height: 0.055; diameter: 0.169.

61.26. Japanese, Edo period (1615–1867), *imari* ware. Jar of *kuan* shape. Clay: white porcelain. Glaze: clear, slightly bluish. Decoration: three plant groups in underglaze blue. Height: 0.237; diameter: 0.220.

62.15. Japanese, Edo period (late Genroku), *imari* ware. Dish with ten-lobed rim. Clay: white porcelain. Glaze: transparent. Decoration: paulonia and diaper pattern painted in underglaze blue, overglaze enamel colors and gold; waves and plum blossoms outside *Daikon* in blue on base. Height: 0.057; diameter: 0.343.

62.18. Japanese, Edo period (late Genroku), *imari* ware. Jar of globular form, with cover and small handle on top. Clay: white porcelain. Glaze: transparent. Decoration: floral patterns, roundels, and diaper patterns in underglaze blue and overglaze enamels and gold. *Daikon* in overglaze red and gold on base. Height: 0.140; diameter: 0.133.

61.29 Japanese, Edo period (1615–1867), Kakiemon ware. Deep bowl of decagonal shape with flaring rim and upturned lip. Clay: white porcelain. Glaze: clear. Decoration: hydrangeas and phoenixes in overglaze enamels; dragon in slip inside; brown rim. Height: 0.101; diameter: 0.210.

61.28. Japanese, Edo period (1615–1867), by Kenzan. Teabowl; round with smooth surface and finely cut thin foot; signed Kenzan. Box. Clay: fairly fine grained brownish buff stoneware. Glaze: clear, finely crackled. Decoration: pine trees with blue needles on ground of white slip, on one side inside, and on the other outside. Height: 0.066; diameter: 0.133. Box: height: 0.124; length: 0.161; width: 0.161.

REPAIRS TO THE COLLECTIONS

Thirty-two Chinese, Japanese, and Indian objects were restored, repaired, or remounted by T. Sugiura, Oriental picture mounter. F. A. Haentschke, illustrator, remounted 73 Indian, Persian, and Arabic paintings. Repairs and regilding of 16 frames for American paintings were done outside the Gallery.

CHANGES IN EXHIBITIONS

Changes in exhibitions amounted to 523, which were as follows:

American art:	
Oils	55
Prints	34
Chinese art:	
Bronze	29
Cloisonné	1
Ivory	4
Jade	40
Lacquer	3
Paintings	25
Pottery	50
Christian art:	
Crystal	2
Glass	6
Gold	20
Manuscripts	43
Stone sculpture	2
Japanese art:	
Gold	2
Lacquer	12
Paintings	66
Pottery	20
Sculpture	3
Near Eastern art:	
Bookbinding	5
Glass	6
Jade	2
Manuscripts	1
Metalwork	37
Paintings	20
Pottery	35

LIBRARY

The library is the research unit for study of the cultures which produced the objects in the collections. The reading room is open to the public Monday through Friday, and 659 college and university students as well as specialists made constant use of the reference materials. No statistics are kept of the use made by the staff or the Freer Fellows and Hackney Scholars who are studying at the Gallery. The need for additional space for both librarians and readers is increasing constantly.

During the year 870 acquisitions (by title) were added to the library; 248 of these were by purchase and 622 by exchange and gift. Outstanding gifts were: 155 titles of books, which supplied many reference books difficult to find, from the library of A. G. Wenley; 36 rare picture books, the gift of Lincoln Kirstein; a copy of *Chūgoku kinseki tōji zukan* (Old Chinese art), the gift of T. Asano and T. Misugi; a rare woodblock print of an 11-headed Kannon of the early Kamakura period (13th century), the gift of R. Hosomi of Osaka, Japan. The outstanding purchase was a copy of *Chieh tzū yüan hua chuan* (Mustard seed garden painting manual), a Japanese recut edition of 1812–17.

The year's record of cataloging included a total of 926 entries of which 485 analytics were made and 283 new titles of books, pamphlets, and microfilms were cataloged. Additions to the continuations of sets of books numbered 158, and 4,815 cards were added to the catalog.

The slide collection was transferred to the library in February 1962. Mrs. Roberta Handler joined the library staff as slide librarian. New equipment for housing the slides was purchased, a manual of procedure outlined, and the work of binding, classification, and labeling has proceeded. During the year 1,884 slides were bound and labeled, and 3,579 were lent.

There were 202 requests for bibliographic information by telephone and letters. Two bibliographies were prepared for publication, and a bibliography of the works of each member of the staff.

Librarians from other museums visited the library for exchange of professional knowledge. Mr. Hewson of Gallaudet College, accompanied by his class of 12 library science students, spent some time at the Gallery observing library methods.

The library staff continued active in the professional associations. Mrs. Hogenson and Mrs. Handler attended the annual conference of the Special Libraries Association in Washington, May 1962. Mrs. Usilton attended the American Library Association in Cleveland, July 1961, and at Miami Beach, Fla., June 1962.

PUBLICATIONS

No publications were issued by the Freer Gallery during this fiscal year.

Publications of staff members were as follows:

CAHILL, JAMES F. *The art of Southern Sung China—Asia House, 1962.* New York, Asia Society, 1962. 103 pp., illus.

———. "The return of the absent servants: Chou Fang's *Double Sixes* restored." *Archives of the Chinese Art Society of America*, vol. 15 (1961), pp. 26–28 incl. illus.

———. Review of "Chinese pictorial art, as viewed by the connoisseur," by R. H. van Gulik. *Journal of the American Oriental Society*, vol. 81 (1961), pp. 448–451.

ETTINGHAUSEN, RICHARD. *Arab painting.* Geneva, Skira, 1962. 208 pp. mount. illus. (part col.) map. (Treasures of Asia.)

———. Review of "Turkish painting," edited with introduction and notes by Emel Esin. *Artibus Asiae*, vol. 24 (1961), p. 73.

———. *Persian miniatures in the Bernard Berenson collection.* Milano, Officine Grafiche Ricordi, 1961. 6 pp., 12 pls., each with descriptive letterpress.

GETTENS, R. J. "Mineral alteration products on ancient metal objects," in *Proceedings of the IIC Rome Conference, 1961*, pp. 171–174.

———. "Proposal for a handbook on analysis of materials of paintings," in *Proceedings of the IIC Rome Conference, 1961*, pp. 47–50.

———. "IIC and ICOM: Conservation meeting in Rome and Barcelona," in *Museum News* (Washington, D.C.), vol. 40, pp. 36–39.

POPE, JOHN A. Review of "Bronze culture of ancient China," by William C. White. *Ars Orientalis*, vol. 4 (1961), pp. 432–440, plate.

PHOTOGRAPHIC LABORATORY AND SALES DESK

The photographic laboratory made 11,461 items during the year as follows: 8,718 prints, 1,222 negatives, 1,605 color slides, and 76 color film sheets. At the sales desk 50,570 items were sold, comprising 4,496 publications and 46,074 reproductions (including postcards, slides, photographs, reproductions in the round, etc.).

BUILDING AND GROUNDS

The exterior of the building appears to be sound and in good condition. Refinishing of the bronze surrounding the court and on the exterior of the north door is underway. The roof is scheduled to be repaired this summer; also the sidewalk in front of the building is to be removed and replaced to conform with the work now being done on the 12th Street underpass.

In the interior, the limestone door frames of the exhibition galleries are being cleaned. All concrete floors were painted and given a protective coat of wax.

The doors leading from the main office to the library were reworked and fitted with glass.

The sales desk at the north entrance was completely refinished on location.

Three hundred twenty seats were installed in the Auditorium.

In general, the courtyard planting is doing well. Four small boxwoods and four azaleas were replaced. Two cotoneasters were replaced with *Ilex* var. *globosa*. A complete new listing and diagram of all plants was made for the Freer Gallery of Art pamphlet. The plantings at the fountain have been made as usual. Each has made a splendid showing in its respective season. Lantana was set out for the summer and is beginning to flourish.

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 130,597. The highest monthly attendance was in April, 21,929.

There were 2,589 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:

1961	
October 10.	Dr. Noel Barnard, Australian National University, Canberra, Australia, "Bronze Casting in Ancient China," Attendance, 145.
November 7.	Dr. Eleanor Consten von Erdberg, Rheinisch-Westphalische Technische Hochschule, Aachen, Germany, "The Japanese House: A Pattern of Simplicity." Attendance, 294.
1962	
January 16.	Prof. Osvald Sirén, Keeper Emeritus of Pictures and Sculptures, National Museum, Stockholm, Sweden, "True and False in Chinese Sculpture." Attendance, 255.
February 13.	Prof. Willy Hartner, Johan Wolfgang Goethe-Universitat, Frankfurt, Germany, "Astrology on Persian Metal Work." Attendance, 206.
March 13.	William Watson, British Museum, London, England, "A New Find of Chinese Bronzes with Human Figurines." Attendance, 183.
April 3.	Dr. James C. Harle, Ashmolean Museum, Oxford, England, "The Art and Architecture of South India." Attendance, 215.

Outside organizations used the auditorium as follows:

The Washington Film Society showed the following films:

"La Retour" and "Under the Roofs of Paris."	October 6.	Attendance, 150.
"Storm over Asia."	October 13.	Attendance, 167.
"Under the Black Mask" and "United Nations Week."	October 20.	Attendance, 119.

"Berlin, Symphony of a Great City" and "Arms and the League."	October 27. Attendance, 155.
"Cabinet of Dr. Caligari."	November 3. Attendance, 154.
"Carnival in Flanders."	November 17. Attendance, 190.
"Vampyr" and "Sunday by the Sea."	November 24. Attendance, 158.
"Seven Samurai."	December 1. Attendance, 193.
"Les Mistons," "Meshes of the Afternoon," and "The Very Eye of Night."	December 8. Attendance, 122.
"El" and "City Lights."	December 15. Attendance, 112.
"Ten Days that Shook the World."	December 22. Attendance, 170.
"The Passion of Joan of Arc."	March 22. Attendance, 132.
	March 23. Attendance, 155.
"Mother" and "Chess Fever."	April 5. Attendance, 137
	April 6. Attendance, 231.
"Tolerance."	May 3. Attendance 153.
	May 4. Attendance, 239.
"Duck Soup," "Primary," and "Musical Poster No. One."	May 10. Attendance, 106.
	May 11. Attendance, 179.
"Italian Straw Hat."	May 17. Attendance, 114.
	May 18. Attendance, 208.
"Thunder over Mexico" and "Mexican Bus Ride."	May 24. Attendance, 96.
	May 25. Attendance, 206.
"Variety" and "The Knockout."	June 7. Attendance, 91.
	June 8. Attendance, 127.
"The Gold Rush" and "Night at the Peking Opera."	June 21. Attendance, 247.
"Eva Wants to Sleep" and "Sunday."	June 28. Attendance, 214.

The U.S. Department of Agriculture held meetings as follows:

Marketing Division.	October 16. Attendance, 176.
	October 17. Attendance, 197.
	October 18. Attendance, 117.
	October 19. Attendance, 129.
Outlook Conference.	November 14. Attendance, 82.
	November 15. Attendance, 447.
4–H Clubs.	November 16. Attendance, 177.
Farmers' Cooperative Service.	December 11. Attendance, 143.
	December 12. Attendance, 144.
	December 13. Attendance, 131.
	December 14. Attendance, 68.
Federal Extension Service.	January 9. Attendance, 185.
	January 10. Attendance, 212.
	January 12. Attendance, 92.
Agricultural Stabilization and Conservation Service.	April 4. Attendance, 194.
Foreign Agricultural Service.	April 9. Attendance, 260.
	April 12. Attendance, 70.
	April 25. Attendance, 117.
	April 26. Attendance, 350.
	April 27. Attendance, 166.

	May 18. Attendance, 82.
	June 6. Attendance, 91.
	June 13. Attendance, 94.
	June 20. Attendance, 127.
	June 27. Attendance, 96.
The Food and Drug Administration held meetings as follows:	
	October 18. Attendance, 119.
	November 2. Attendance, 264.
	December 20. Attendance, 91.
	January 17. Attendance, 67.
	March 21. Attendance, 78.
	March 27. Attendance, 66.
	April 12. Attendance, 70.
	May 16. Attendance, 82.
The Washington Society, Archeological Institute of America, held illustrated lectures as follows:	
Dr. Zakby Iskander, Department of Antiquities, Cairo, Egypt: "Tutankhamun's Treasures."	November 9. Attendance, 193.
Dr. J. O. Brew, Director, Peabody Museum, Harvard University: "The Drowning Sphinx: Salvage Archeology in Advance of Technical Progress in Nubia."	November 30. Attendance, 143.
Japan-America Society, two recitals by Miss Miyoko Watanabe, *Kabuki* dancer, and Mr. Kimio Eto, *koto* player.	December 2. Attendance, 660.
American Chemical Society.	February 8. Attendance, 51.
Washington Society, Archeological Institute of America.	February 8. Attendance, 221.
Washington Fashion Group, programs by Eleni Epstein, fashion editor, Washington *Star*.	March 5. Attendance, 275. March 12. Attendance, 243. March 19. Attendance, 197. March 26. Attendance, 219. April 2. Attendance, 198.
Japan-America Society and Washington Film Society, two showings of Japanese film, "Jochuku" and selected short subject.	March 30. Attendance, 423.
Morgan State College, lecture by Dr. Robert P. Multhauf, Department of Science and Technology, Smithsonian Institution.	April 27. Attendance, 278.

Overall total attendance in the auditorium for the year was 13,417.

STAFF ACTIVITIES

The work of the staff members was devoted to the study of new accessions, of objects contemplated for purchase, and of objects submitted for examination, as well as to individual research projects in the fields represented by the collection of Chinese, Japanese, Persian, Arabic, and Indian materials. Reports, oral and written, and exclusive of those made by the technical laboratory (listed below), were made on 10,893 objects as follows: For private individuals, 3,269;

for dealers, 1,785; for other museums, 5,839. In all, 440 photographs were examined, and 920 Oriental language inscriptions were translated for outside individuals and institutions. By request, 24 groups totaling 489 persons met in the exhibition galleries for docent service by the staff members. Five groups totaling 20 persons were given docent service by staff members in the storage rooms.

Among the visitors were 61 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	140
Outside objects examined	113

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

1. For a period of 2 weeks in October and November 1961, Miss E. West worked as a guest of the Conservation Center of the Institute of Fine Arts, New York University, where she continued the spectrochemical analyses of inscribed Chinese ceremonial bronzes in the Freer collections.

2. 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.

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

4. Continued analysis by wet chemical methods of Chinese bronzes in the Freer collections.

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

1961

September 13.	Dr. Pope, at the College Art Association, New York City, "Collecting Oriental Art in America." Attendance, 250.
September 18.	Dr. Stern, at the Kunstindustrie Museum, Copenhagen, Denmark, "Popular Painting in Tokugawa Japan." Attendance, 100.
September 25.	Dr. Cahill, at the Society for Asian Art, San Francisco, Calif., "Some Distinctions in Chinese Paintings." Attendance, 100.
September 25.	Mr. Gettens, at the International Institute for Conservation of Historic and Artistic Works, conference in Rome, Italy, "Museum Climate." Attendance, 190.
September 26.	Mr. Gettens, at the International Institute for Conservation of Historic and Artistic Works, conference in Rome, "Proposal for a Handbook on Painting Material." Attendance, 190.

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September 27. Dr. Cahill, at the Oakland Art Museum, Colloquium Orientalogicum. University of California, Oakland, Calif., "Some Problems in the Dating and Attribution of Chinese Paintings." Attendance, 35.

October 4. Dr. Stern, at the Ethnographic Museum, Münich, Germany, "Popular Painting in Tokugawa Japan." Attendance, 25.

October 5. Dr. Stern, at Société Suisse Japon, Zürich, Switzerland, "Popular Painting in Tokugawa Japan." Attendance, 30.

October 6. Dr. Cahill, at the United States Department of Agriculture Overseas Club, Washington, D.C., "Chinese Art." Attendance, 75.

October 17. Dr. Pope, at the Winterthur Museum, Winterthur, Del., "Chinese Porcelains at Home and Abroad." Attendance, 240.

October 20. Dr. Stern, at the Musée Guimet, Paris, France, for staff members only, "Popular Painting in Tokugawa Japan." Attendance, 5.

October 26. Dr. Cahill, at the Metropolitan Museum of Art, New York City, "Chinese Art Treasures." Attendance, 400.

October 27. Dr. Stern, at the Museum of Asiatic Studies, Amsterdam, Holland, "Popular Painting in Tokugawa Japan." Attendance, 150.

November 6. Dr. Cahill, at the Philadelphia Museum of Art, Philadelphia, Pa., "Some Distinctions in Chinese Paintings." Attendance, 200.

November 7. Dr. Stern, at the Victoria and Albert Museum, London, England, "Popular Painting in Tokugawa Japan." Attendance, 250.

November 7. Mr. Gettens, at the American Embassy, London, England, "Technical Studies of Works of Art." Attendance, 50.

November 13. Dr. Pope, at the Alexandria Association, Alexandria, Va., "Chinese Porcelains at Home and Abroad." Attendance, 50.

November 20. Dr. Ettinghausen, at the Center of Mid-Eastern Studies, Fogg Art Museum, Cambridge, Mass., "Pictorial Arts of the Umayyads." Attendance, 70.

December 1. Dr. Cahill, at the American University (Seminar Group), Washington, D.C., "Chinese Painting and the Contemporary West." Attendance, 30.

December 5. Dr. Ettinghausen, at the Institute of Fine Arts, New York University, New York City, "Opportunities for Studies and Careers in Near Eastern Art." (Not illustrated.) Attendance, 30.

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January 7, 9. Dr. Pope, at the Museum of Fine Arts, Boston, Mass., "Chinese Art Treasures." Attendance, each day, 400; total 800.

January 8, 9. Dr. Cahill, at Smith College, Northampton, Mass., "Contemporary Relevance of Chinese Painting to the Modern West." Attendance, each day, 750; total, 1,500.

1962

January 12. Dr. Ettinghausen, at International Student House, Washington, D.C., "Western and Eastern Art: A Comparison." Attendance, 40.

January 24. Dr. Stern, at the Regents' Meeting, Smithsonian Institution, "Research Contrast—Japanese Art in European Collections." Attendance, 26.

February 2. Dr. Stern, at the Norfolk Museum of Art, Norfolk, Va., "Popular Painting in Tokugawa Japan." Attendance, 150.

February 4. Dr. Cahill, at the Washington County Museum, Hagerstown, Md., "Chinese Art." Attendance, 150.

February 5. Dr. Pope, at the Norfolk Museum of Art, Norfolk, Va., "Oriental Pottery." Attendance, 100.

February 5. Dr. Cahill gave the first of 16 lectures at American University, Washington, D.C.; there were 25 students in the group.

February 15. Dr. Pope, at the Art Institute of Chicago, Chicago, Ill., "Chinese Art Treasures." Attendance, 500.

February 16. Dr. Pope, at The Orientals, Art Institute of Chicago, gave a gallery talk and lecture, "Chinese Art Treasures." Total attendance, 175.

March 2. Dr. Stern, at the Norton Gallery, Palm Beach, Fla., "Popular Painting of Tokugawa Japan." Attendance, 60.

March 20. Dr. Cahill, at the Cleveland Park Club, Washington, D.C., "Chinese Art." Attendance, 35.

March 25. Dr. Cahill, at Asia House, New York City, "The Art of Southern Sung China." Attendance, 250.

March 31. Dr. Ettinghausen, at the Hajji-Baba Club, New York City, "Persian and Mughal Miniatures." Attendance, 52.

April 5. Dr. Stern, at the American Oriental Society, Harvard University, Cambridge, Mass., "A Japanese Screen Painting: Kamikaze versus Christian." Attendance, 30.

April 9. Dr. Pope, at the Cosmos Club, Washington, D.C., "Chinese Porcelains at Home and Abroad." Attendance, 175.

April 9, 10. Dr. Ettinghausen, at the 15th Annual Symposium on Art, Sarasota, Fla., "Persian Painting" and "Persian and Indian Painting." Attendance, respectively, 325 and 275; total, 600.

April 18. Dr. Ettinghausen, at the University of Michigan, Department of the History of Art, Ann Arbor, Mich., "Political Themes in Early Muslim Paintings and Mosaics." Attendance, 100.

May 3. Dr. Stern, at the Japan Society, Asia House, New York City, "A Survey of Japanese Art." Attendance, 175.

May 9. Dr. Cahill, at the De Young Memorial Museum, San Francisco, Calif., "Chinese Art Treasures," Attendance, 400.

May 9. Mr. Gettens, at the Abracadabra Club, Washington, D.C., "Minerals in Art." Attendance, 30.

May 10. Dr. Ettinghausen, at the Asia Society, New York City, "Herat School of Painting." Attendance, 180.

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May 11. Dr. Ettinghausen, at the Institute of Fine Arts, New York University, New York City, "Political Themes in Early Islamic Paintings and Mosaics." Attendance, 95.

May 15. Dr. Cahill, at the De Young Memorial Museum, San Francisco, Calif., "Chinese Art Treasures," and "Chinese Figure, Bird, Flower and Animal Painting." Attendance, each lecture, 400; total, 800.

May 16. Mr. Gettens, at the U.S. Department of Health, Education, and Welfare, Food and Drug Administration, Washington, D.C., "Analytical Problems in Archaeology." Attendance, 82.

May 16. Dr. Cahill, at a seminar, Stanford University, Stanford, Calif., "Connoisseurship of Chinese Painting," and lecture, "Chinese Art Treasures." Attendance, respectively, 15 and 200; total, 215.

May 17. Dr. Cahill, at the University of California, Berkeley, Calif., "Great Paintings in the Chinese Art Treasures Exhibition" and "The Contemporary Relevance of Chinese Painting." Attendance, respectively, 250 and 300.

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

1961

July 5–8. Dr. Stern, in New York City, examined objects at dealers and in museums.

July 8–10. Dr. Stern, in Boston, Mass., examined objects at dealers and in museums.

July 9–15. Mrs. Usilton, Librarian, in Cleveland, Ohio, attended the meetings of the American Library Association.

July 29. Dr. Ettinghausen, in New York City, examined objects at dealers.

August 25–January 8. Dr. Stern, in Europe, examined objects in museums, in private collections, and at dealers; and consulted with colleagues in various institutions of learning, which involved travel in Sweden, Denmark, Germany, Switzerland, France, Belgium, Holland, England, Scotland, Italy, and Greece.

September 4–15. Dr. Cahill, in New Haven, Conn., and New York City, examined objects at dealers, and in private collections. He attended the International Congress of Art Historians at Columbia University, a session of the College Art Association, Biltmore Hotel, and a reception of that group at the Institute of Fine Arts, New York University. He also attended the dinner and opening of the Chinese Art Treasures Exhibition at the Metropolitan Museum of Art, and saw the exhibition of Peasant and Nomad Carpets of Asia at Asia House.

September 13–15. Dr. Pope, in New York City, attended the dinner and opening of the Chinese Art Treasures Exhibition at the Metropolitan Museum of Art, and examined objects at dealers.

1961

September 9–November 25.	Mr. Gettens, in Europe, attended meetings of conference of the International Institute for Conservation of Historic and Artistic Works, in Rome, Italy; and meetings of the International Council of Museums, in Barcelona, Spain, where he read a paper, "Report on the Study of Metallic Antiquities." He traveled extensively in Italy, Spain, Greece, Turkey, Switzerland, France, Belgium, and England, where he examined antiquities in various museums and private collections; visited various archeological sites, and historical locations and monuments.
October 17–18.	Dr. Pope conducted a seminar on Chinese Trade Porcelains, at Winterthur Museum, Winterthur, Del. Attendance, 87.
October 20–25.	Dr. Ettinghausen, in New York City, attended the Social Science Research Council Conference on Muslim Self and Image; he also examined objects at various dealers.
October 23–29.	Dr. Pope, in Boston, examined objects in the Morse Collection at the Museum of Fine Arts, and Japanese ceramics at the Fogg Art Museum. He also attended a meeting of the Committee to Visit Department of Far Eastern Civilizations, Harvard University.
October 23–November 3.	Miss West worked as a guest of the Conservation Center of the Institute of Fine Arts, New York University, carrying out spectrographic analyses of Chinese bronzes and glazes from the Freer collections.
October 30.	Dr. Pope, in New York City, examined objects at various dealers.
November 7.	Dr. Pope, in Baltimore, examined objects at the Baltimore Museum of Art and at the Walters Art Gallery.
November 15.	Miss West, Dr. Cahill, and Mr. Sugiura, in New York City, attended a Symposium on "Paper and Textile Supported Art Objects."
November 15–21.	Dr. Ettinghausen attended the Annual Conference of American Research Center in Egypt, at the Boston Museum of Fine Arts, as a trustee. He also examined objects at various dealers and in one private collection in New York City.
November 19.	Dr. Pope, in Philadelphia, appeared as a panelist on the University of Pennsylvania TV program, "What in the World," over WCAU–TV.
December 14–21.	Dr. Ettinghausen, in Paris, France, attended the exhibition of "Seven Thousand Years of Iranian Art," held at the Petit Palais; he also examined objects at various dealers.

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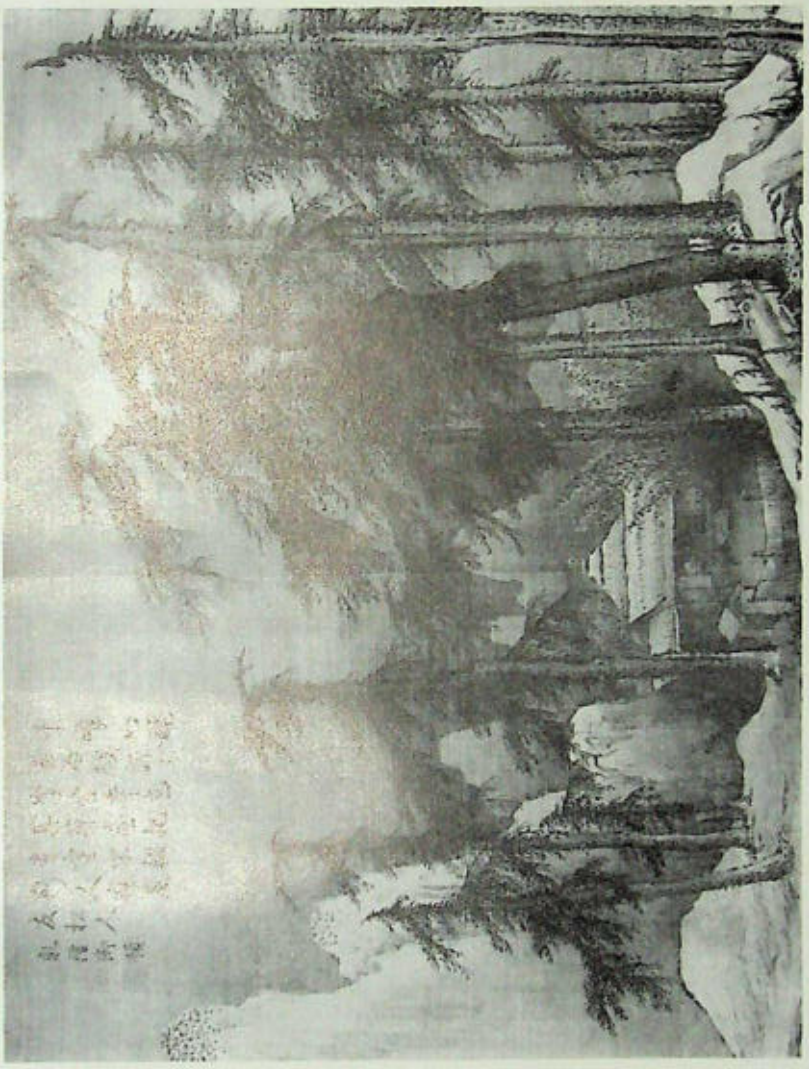
January 10–12.	Dr. Pope, in New York City, examined objects at various dealers.
January 11.	Dr. Cahill, in Boston, visited the Chinese Art Treasures Exhibition at the Museum of Fine Arts, where he gave several gallery talks, and examined Chinese paintings in the permanent collection.

61.25. Japanese painting, Edo period, Ukiyoe school; "Woman with a Puppet" by Tsukioka Settei. Freer Gallery of Art.

61.33. Chinese bronze *kuang*, Shang dynasty. Freer Gallery of Art.



61.34. Chinese painting, Sung dynasty, by Li Shan. Freer Gallery of Art.

62.1. Persian (Sasanian) silver bowl, 6th century A.D. Freer Gallery of Art.

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January 13.	Dr. Cahill, in New York City, visited the Chinese painting exhibition at the Mi Chou Galleries; and examined objects for a dealer and in a private collection.
February 24.	Dr. Pope, in New York City, attended a meeting at the American Council of Learned Societies as Chairman of ACLS–SSRC Joint Committee on Grants for Research on Asia.
March 2.	Dr. Stern, in Palm Beach, Fla., examined objects for a number of private individuals, and at the Norton Gallery.
March 23.	Dr. Stern and Mr. Gettens, in New York City, attended a meeting with representatives of New York University and Mr. McLane of the Rockefeller Foundation re: plans for setting up a course in conservation of art objects.
March 23.	Dr. Cahill, in New York City, met with Mr. Compton of the Rockefeller Foundation re: plans for photographing the Chinese collections of art objects in Taiwan.
March 25.	Dr. Pope, in Baltimore, examined objects at the Baltimore Museum of Art.
April 2–4.	Dr. Pope and Dr. Stern, in Boston, attended meetings of the American Oriental Society.
April 6.	Dr. Stern, in New York City, attended a training program meeting at the New York Conservation Center.
May 3–4.	Mrs. L. O. West attended the meetings of the Museum Sales Association at the Munson-Williams Proctor Institute, Utica, N.Y., and the Corning Glass Works, Corning, N.Y.
May 7–10.	Dr. Pope, in New York City, examined objects at various dealers.
May 8–18.	Dr. Cahill, in California, was a member of a panel discussion on a radio broadcast from Station KPFA, Berkeley; was interviewed regarding the Chinese Art Treasures Exhibition, Station KPIX–TV, San Francisco; and made tape recordings for future broadcasts, of an interview on The Chinese Art Treasures, and the Smithsonian Institution, Station KCBS, San Francisco.
May 15.	Dr. Pope, in Ann Arbor, attended a meeting of the Freer Fund Committee at the University of Michigan.
May 25.	Dr. Stern and Mr. Sugiura visited the Philadelphia Museum of Art, where they examined Far Eastern paintings in need of repair.
June 1.	Dr. Cahill, in New York City, attended a conference at the Rockefeller Foundation re: his proposed trip to Taiwan.
June 1, 2.	Dr. Pope and Dr. Cahill, in New York City, attended a conference on the Study of Chinese Civilization at the American Council of Learned Societies.
June 4–7.	Mr. Gettens and Miss E. West, at Williamsburg, Va., attended meetings of the American Association of Museums, and the IIC-American Group, where Miss West served as Chairman of the Art Technical Section.
June 5–8.	Dr. Pope, at Williamsburg, Va., attended meetings of the American Association of Museums.

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June 14.	Dr. Pope and Dr. Cahill, at Mt. Kisco, N.Y., visited the home of Mrs. Eugene Meyer, where they examined Far Eastern objects.
June 14–15.	Dr. Stern, in Philadelphia, visited the collections in the Philadelphia Museum of Art and examined objects in a private collection.
June 15.	Dr. Cahill, in New York City, examined objects at various dealers.
June 18–22.	Mrs. Bertha Usilton, in Miami, Fla., attended meetings of the American Library Association.
June 21.	Dr. Ettinghausen, in New York City, examined objects at dealers.
June 29–30.	Dr. Ettinghausen, in New York City, attended a dinner meeting of the Iran Foundation, Inc.; examined objects at one dealer's, and visited the collections at the Metropolitan Museum of Art and the Jewish Museum.

As in former years, members of the staff undertook a wide variety of peripheral duties outside the Gallery, served on committees, held honorary posts, and received recognitions.

Respectfully submitted,

JOHN A. POPE, *Director.*

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the National 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, 1962:

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

All records for visitors in the Air and Space Building were broken during the year with a total of 1,986,319. This was more than double the count of 987,858 for fiscal year 1961 and reflects the growing interest in the historic relics of air and space flight. Although this old (1917) building contains but 17,400 square feet and houses less than 5 percent of the National Aeronautics and Space Collection, it had the third largest visitor count of the Smithsonian museum buildings. The largest single day's count exceeded 31,000. One aircraft had to be removed to make room for people!

The Museum received many historically significant accessions during the year. Here are a few examples: the Air Force-Douglas C–54 "Sacred Cow," first Presidential aircraft, and an F–86A North American Fighter aircraft, from the U.S. Air Force; a Bellanca CF airplane and an Anzani three-cylinder air-cooled radial engine, from Mrs. Guiseppi Bellanca; instrumented duplicates of Pioneer IV, Lunar Space Probe and the Explorer I, America's first orbiting satellite, from the Jet Propulsion Laboratory; the General Thomas D. White Air Force Space Trophy from Dr. Thomas W. McKnew; Astronaut Alan B. Shepard's Mercury Spacecraft "Freedom 7," from the National Aeronautics and Space Administration; a Polaris rocket from the U.S. Navy; and the original "Journal des Marches et Operations" kept by Capt. Georges Thenault, French Commander of the Lafayette Escadrille, from Madame Thenault.

One of the most active and increasing functions of the Museum continues to be information service. During the year the Museum averaged more than 600 letters per month, furnishing historical, technical, and biographical information on air and space flight to authors, researchers, schools, Government agencies, students, and the public.

ADVISORY BOARD

A meeting of the Advisory Board was held on March 21, 1962, with all members present. Among the actions taken by the Board were

the following: Approval of the appointment of Alfred V. Verville as an honorary fellow of the National Air Museum; approval of the inauguration of a series of publications called "Smithsonian Annals of Flight"; and approval of the preliminary floor arrangement and interior concept of the proposed new National Air Museum Building, planning funds for the building to be included in the 1964 budget.

SPECIAL EVENTS

Many distinguished visitors came to the Museum during the year. Among these were U.S. Astronauts Shepard, Glenn, and Grissom and Soviet Union Cosmonaut Titov.

Among the special presentation and commemorative ceremonies held were: The Polaris rocket, presented by the Honorable Paul B. Fay, Jr., Under Secretary of the Navy; "Freedom 7," presented by the Honorable James E. Webb, NASA Administrator; "Sacred Cow," presented by Maj. Gen. Brooke E. Allen, U.S. Air Force; Whittle Engine Anniversary Commemoration, with his Excellency Sir David Ormsby Gore, British Ambassador; reproduction of the A–1, the Navy's first airplane, by Adm. James S. Russell, U.S. Navy; "Boedy's Album," a collection of some 12,000 autographed photographs of people in aviation, by Kenneth Boedecker; portrait of Amelia Earhart, by Blanche Noyes, Zonta Club of Washington.

The director attended a number of the annual meetings of aviation, aerospace, and educational organizations and societies. He also visited a number of Air Force and Navy bases, NASA centers, and major contractors of these agencies in the aerospace flight program. He spoke frequently on these visits, emphasizing the importance of the proper preservation and recording of the space flight history currently being made. This has resulted in an increased flow of historical material and information to the museum.

Paul E. Garber, head curator and historian, and Curators Louis S. Casey and Kenneth E. Newland represented the Museum at a number of aviation and aerospace meetings during the year and spoke on the work of the Museum. Mr. Garber delivered 42 lectures.

IMPROVEMENTS IN EXHIBITS

Continued experiments with means and methods of display in the Air and Space Building provide valuable experience in planning the exhibits for the new building.

REPAIR, PRESERVATION, AND RESTORATION

The acquisition of surplus machines, parts, and tools for the preservation and restoration division at Silver Hill, Md., has improved this facility. Storage, restoration, preservation, and the preparation of aircraft and engines for display are full-time activities of the staff.

ASSISTANCE TO GOVERNMENT DEPARTMENTS

The Museum continued its service to various Government departments during the year. Included were the Federal Aviation Agency, NASA, Library of Congress, Department of Justice, U.S. Navy, and U.S. Air Force.

REFERENCE MATERIAL AND ACKNOWLEDGMENTS

The library, reference files, and photographic files of the Museum have been greatly enriched during the year with new materials. These are very valuable to staff and visitor researchers in providing information, authenticating historical data.

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

ACADEMY OF AERONAUTICS, INC., Flushing, N.Y.: Six boxes of periodicals.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION, J. B. HARTRANFT, JR., Bethesda, Md.: Two cabinets each with 20 drawers for IBM card files; 37 of the drawers have IBM cards filed by aircraft registration numbers.

ALTHIN, DR. TORSTEN, Stockholm, Sweden: Book titled "Moderna Luftfartyg," in Swedish and published in 1910.

ARMSTRONG, ROBERT, AIRCRAFT OWNERS AND PILOTS ASSOCIATION, Bethesda, Md.: AOP's Yellow Guide to Aircraft Listings.

ATWELL, LT. COMDR. ROBERT B., USN, Norfolk, Va.: An aeronautical map of the United States, Canada, Cuba, and Mexico, made by James T. Igoe Co., copyright 1930.

AZBE, VICTOR J., AZBE CORP., St. Louis, Mo.: Original letter written by Major Parseval; photograph of Major Parseval.

BEAIRD, HENRY G., JR., SWISS AMERICAN AVIATION CORP., St. Gallen, Switzerland: Photos of SAAC-23⅒ scale model; three-view and longitudinal drawings; preliminary specifications list.

BERLINER, COL. HENRY, Washington, D.C.: Photograph of Emile Berliner, two scrapbooks.

BRAND, HARRISON, JR., AEROSPACE INDUSTRIES ASSOCIATION, Washington, D.C.: Three books, "American Heroes of the War in the Air," by Howard Mingos and inscribed by the author; "The Birth of an Air Industry"; "Air Power for Peace."

BRYANT, MAJ. ROBERT L., USAF, DIRECTOR, AIR FORCE MUSEUM, Wright-Patterson AFB, Ohio: Approximately 1,500 linear feet of documents on foreign aircraft; photos and drawings on commercial aircraft and others on the theory, history, and development of aviation.

COCHRAN, MISS JACQUELINE, Washington, D.C.: A dossier requesting the homologation of two world records by Alan B. Shepard in "Freedom 7."

COOKE, DAVID C., Valley Stream, N.Y.: Books, "Racing Planes That Made History"; "Flights That Made History"; "Jet and Rocket Planes That Made History"—all by David C. Cooke.

DAY, CURTISS L., Elkhart, Ind.: 25 Photographs of early planes and flyers. Circa 1910–11.

DODD, MEAD & CO. INC., New York, N.Y.: A book, "Wonders of Flight," by Robert Wells.

DOOLITTLE, LT. GEN. JAMES H., Redondo Beach, Calif.: 36 black and white aerial photos, unmounted; 4 mounted black and white aerial photos; 2 mounted

color aerial photos; 1 print, "The First Carriage, The Ariel"; 1 drawing, "Tut-ankh-amen's Battleplane"; 1 drawing color, "British Schneider Trophy Team, 1929"; 2 sets of photographs of J. H. Doolittle tablecloth, 6 photographs to a set.

DRAIN, CAPT. NICHOLAS A. USN (Ret.), Ventura, Calif.: Original patent for low-drag, metal aircraft rivet joint.

DRIGGS, IVAN H., Washington, D.C.: Assorted photographs, Mr. Driggs' proof copy of article written by Mr. Driggs and Mr. Lancaster on "Gas Turbines for Aircraft." Brochure on Luscome Airplane Development Corp., newspaper clippings.

ENGSTRUM, PAUL, Arlington, Va.: Pamphlet, photograph, and clippings illustrating and describing the Slate all-metal dirigible airship SMD–100, proposed as a cargo-handling long-range versatile vehicle especially for airlifting parts of space vehicles. One large mounted photograph of the Slate airship of 1928; one photograph of proposed Slate airship; two copies of article from "Aeronautical World" for September 1928 describing Slate airship.

EVANS, A. W., MCDONNELL AIRCRAFT CORP., St. Louis, Mo.: Twelve 11" x 14" color photographs of F4H–1 aircraft.

FAIRBANK, MURRY N., Belmont, Mass.: 5 paintings of early aircraft; 3 photos of Burgess airplanes; 4 photos of Harvard-Boston Meet, 1911; 6 Burgess Aeroplane brochures; 1 folder containing newspaper clippings and magazine articles; 1 folder of transcripts from G. S. Curtiss diaries and interviews; 18 blueprints, pencil drawings, and an original tracing of Burgess Navy Hyroaeroplane, Twin Float, March 1919.

FLIEDNER, C. S., Chevy Chase, Md.: About 14 file cases of books, photographs, and other material.

FRANK, MAJ. GEN. W. H., Washington, D.C.: Eight photograph albums, historical set of aeronautical photographs, 1906–17.

FRIEDMAN, MITCHELL, Belleville, N.J.: Cross-section view of a Warner "Scarab" engine. General information about the Lambert R–266 air-cooled radial engine. General information plus a picture and a drawing of the Wright-Hispano 8-cylinder V-type water-cooled engine. The Waco Model "F" airplane booklet. 21 tracings of models A, E, I, and H Hispano-Suiza engines.

FRITSCHE, CARL B., Alexandria, Va.: Pamphlets, "The Metalclad Airship," "Some Economic Aspects of the Rigid Airship," all by Carl B. Fritsche; book, "The Metalclad Airship ZMC–2."

GILLESPIE, GEORGE M., Miami, Fla.: Copy of poem "Prayer Becomes Our Shepard's Rainbow" written by George M. Gillespie. Copy of letter from Commander Shepard to Mr. Gillespie.

GLOVER, GEORGE, Northwood, Mass.: Book, "European Sporting Activities Amsterdam-Cologne," by Kiesel & Hulek.

GOFF, COL. E. A., Edgewater, Md.: Book, "First Transcontinental Flight," by Charles S. Wiggin.

GRAY, CAPT. A. A., USNR, McLean, Va.: Photocopies of following: one certificate, attesting to crossing by air of international date line; one photo, 7" x 5", of crew who made first commercial flight to Suva, Fiji Island, photographed with Fiji chiefs; one framed photo, 8" x 10", of the S–42 arriving at Diamond Head, Hawaii, on first flight, April 7, 1935; one postcard, 5½" x 3½", California Clipper at Cavite, P.I.; one photo, 5" x 7" Boeing 314 at Honolulu, February 1939; one photo 9½" x 7", China Clipper leaving San Francisco; one framed photo, 8" x 10", of Capt. Ed Musick.

HARLOW, MAX B., Pasadena, Calif.: Brochure and 3-view drawing on the Atlas Model H–10 airplane; brochure, photograph, and 3-view drawing of the

Harlow PJC–2 airplane; photograph and two 3-view drawings of the Harlow PC–5 airplane.

HATCH, DENISON, Franklin Watts, Inc., New York, N.Y.: Book, "Early Air Pioneers, 1862–1935," by Maj. James F. Sunderman.

HENRY FORD MUSEUM, Dearborn, Mich.: 8" x 10" photograph showing left front view of Packard diesel-powered Stinson "Detroiter" Model SM–1B. On the side of the fuselage are painted the words, "This airplane powered with original Packard diesel aircraft engine made world's first diesel powered flight, September 19, 1928."

HIGHAM, DR. ROBIN, Chapel Hill, N.C.: Book, "Rolls-Royce Dart Aero-Engine Maintenance Manual."

HINSON, MR. AND MRS. JOHN A., New York, N.Y.: Insurance policy issued to Harry Houdini in 1909 for his aeroplane; photo of aeroplane (Farman).

IRVIN, LESLIE L.: Newspaper clippings, magazine articles, Parachute Manual by Engineering Division Air Service.

JENSEN, VOLMER, Volmer Aircraft, Burbank, Calif.: Three-view drawing of the VJ–22 airplane.

KERLEY, ROBERT V., Ethyl Corp., Detroit, Mich.: Book, "History of the Aircraft Piston Engine," by S. D. Heron, subtitle, "A Brief Outline," preface by Lt. Gen. James H. Doolittle, USAF, published by the Ethyl Corp., Research and Development Department.

KORN, EDWARD A., East Orange, N.J.: Two 8" x 10" photographs of Mr. Korn.

LARKINS, WILLIAM T., Concord, Calif.: Book, "U.S. Navy Aircraft 1921–1941," by William T. Larkins.

LIPPINCOTT, HARVEY H., Connecticut Historical Society, Hartford, Conn.: Cross-section drawing at Pratt & Whitney Aircraft Engine No. 1 Wasp Model A.

LARSEN, DOUGLAS, A., General Dynamics Corp., Washington, D.C.: Book, "Dynamic America."

LIPKIS, LEON G., Los Angeles, Calif.: Book, "The 541st Bomb Squadron."

MACKENZIE, ROY JAY, Cranston, R.I.: Texaco house organ, vol. 24, No. 2, "The Texaco Star Aviation Number"; Rhode Island Review, vol. 1, No. 3; 17 aviation photographs.

MASSIN, ALEX, Ontario, Canada: 6 magazines, 21 commemorative envelopes.

MCDONNELL, AIRCRAFT CORP., St. Louis, Mo: Three copies of "Report No. 8422, October 9, 1961; Freedom 7, May 5, 1961"; a 67-page illustrated report of the capsule used in the first Mercury manned space flight and the renovations made to it prior to its being placed in the National Air Museum; line drawings, colored charts, picture of "Freedom 7" on cover, size 11⅞" x 8¾".

MCGOWAN, JOHN, FRANKLIN INSTITUTE, Philadelphia, Pa.: Microfilm of Wright Brothers material containing a series of laboratory notebooks, data sheets, notes on various wind tunnel tests, sketches and original drawings of the 1903, 1904, 1905, 1907, and 1910 biplanes.

MEANS, DR. J. H., Boston, Mass.: Three books edited by James Means: "The Aeronautical Annual 1897," No. 3; "The Aeronautical Annual 1895," No. 1; "Epitome of the Aeronautical Annual 1910."

MEYER, ROBERT B., Jr., Potomac, Md.: Nine 5-view drawings by E. F. Schmidt.

MIKESH, CAPT. ROBERT C., USAF, Washington, D.C.: One 8" x 10" photo, one 4" x 5" transparency, one sheet of operational history of the C–54 "Sacred Cow."

MOLSON, K. M., NATIONAL AVIATION MUSEUM, Ottawa, Canada: Transcript of the clippings from J. A. S. McCurdy scrapbook.

MOODY, JAY H., Oklahoma City, Okla.: Book, "Aircraft and Engine Code Book."

MOREHOUSE, HAROLD E., Williamsport, Pa.: 44 illustrated biographies which appeared in various issues of the "American Aviation Historical Society

Journal"; two copies of biography of his life; one copy of description of the Kettering Aerial Torpedo (1917–18) titled "The Dayton-Wright World War I 'Bug' Story," and a photograph of himself; eight 3" x 4" photographs of persons connected with the Kettering "Bug" Aerial Torpedo project of World War I and one 5" x 7" photograph of the type of "Bug" constructed during the 1930's.

MOUREY, RICHARD D., KAMAN AIRCRAFT CORP., Bloomfield, Conn.: Eleven 8" x 10" photographs of Kaman helicopters.

MOYERMAN, SAMUEL, Philadelphia, Pa.: 15 pilots' logbooks covering period 1917–39.

NAVY, DEPARTMENT OF THE, BUREAU OF AERONAUTICS LIBRARY, Washington, D.C.: 83 volumes of aviation books.

NAVY, DEPARTMENT OF THE, NAVAL PHOTOGRAPHIC CENTER, Washington, D.C.: Five 16-mm movie films, MN–1539Z—"K" Type Airship Take-off Operation; MN–1539AA—"K" Type Airship, L.T.A. Landings; MN–2722A—History of Balloons; MN–6135—Lighter Than Air Training; MN–6830—The Airship Fundamental Principles and Operation.

NAVY, DEPARTMENT OF THE, DEPARTMENT OF SPECIAL PROJECTS, Washington, D.C.: Book, "Polaris."

NAVY, DEPARTMENT OF THE, BUREAU OF WEAPONS, Washington, D.C.: One volume entitled "Seaplane and Flying Boats—Line and Test Data for Early Aeronautical Models, 1336 to 2234."

NATIONAL AVIATION MUSEUM, Ottawa, Canada: Five 5" x 7" photographs of Curtiss Model L airplane engine of 1910–11.

PETERSON, JOHN J., NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, Langley AFB, Va.: Booklet, "Results of the First U.S. Manned Suborbital Space Flight."

POBEREZNY, PAUL H., EXPERIMENTAL AIRCRAFT ASSOCIATION, Hales Corners, Wis.: A set of Health Parasol drawings, 14 sheets; set of EAA Biplane drawings, 15 sheets.

PFEIFER, JOE, Porterville, Calif.: Framed photograph.

RAMSEY, MRS. DEWITT C., Washington, D.C.: A collection of 149 books from Admiral DeWitt C. Ramsey.

REYNOLDS, BRUCE, Santa Barbara, Calif.: Eight 5" x 7" photographs, two 3½" x 6" photographs, one 4" x 6" photographs, 19 8" x 10" photographs from Frank Bryant.

RING, GRANT A., UNITED AIRCRAFT CORP., East Hartford, Conn.: 9 annual reports and 3 pieces of literature dealing with company growth.

SCEARCE, W. R., CAPITAL AIRLINES, Washington, D.C.: Airline schedules and chronological history of Capital Airlines Service; 17 8" x 10" photographs; book, "Biography of a Pioneer."

SCHOENE, ARTHUR L., CHANCE VOUGHT CORP., Dallas, Tex.: 26 8" x 10" photographs of the "V" type Vought aircraft.

SHAW, W. H., QANTAS AIRLINE, London, England: Research report on Lawrence Hargrave, "The Aeronautical Work of Lawrence Hargrave (1850–1915)."

SCOENI, R., CHANCE VOUGHT AIRCRAFT, Dallas, Tex.: 41 8" x 10" photos; 1 genealogy chart; 1 Corsair Outline F4U; 1 reprint of the "Flying Pancake" from Air Pictorial, February 1959; 1 chronological history of Corsair; 1 biography of Chance Milton Vought; 1 historical Data Production Airplanes made by Chance Vought Aircraft; 1 list of Chance Vought "Firsts"; 1 historical sketch on F4U; 1 reprint from Naval Aviation News, March 1957.

SPEIZMAN, WILLIAM J., Silver Spring, Md.: Book, "Instructions for the Care and Operation of Model A–I and E Hispano-Suiza Aeronautical Engines."

STEPTOE, THOMAS E., ESTATE OF, Fontana, Calif.: Two albums; one airmail and one Early Birds; one file folder on Early Birds.

STITS, RAYMOND, Riverside, Calif.: SA–7D "Skycoupe," 30 sheets, 1 photo; SA–3B "Playboy," 12 sheets, 7 photos; SA–3A "Playboy," 12 sheets, 6 photos, SA–6B, "Flut-R-Bug," 18 sheets, 5 photos; 7 8" x 10" photos, 1 general arrangement of Stits aircraft, Model SA–9A plan.

STUDER, MRS. CLARA, West Medford, Mass.: A recorded tape, pastel portrait, photographs, copies of letters, news clippings, and other texts pertaining to Amelia Earhart; two texts relative to airmail history and philately.

TILLMAN, RAY, MERCURY AIRCRAFT, INC., Hammondsport, N.Y.: Duplicate and copies of Howard Shaver collection of air-mail photographs.

TRUCK, LT. COMDR. W. J., SCIENCE MUSEUM, London, England: Two sets of 2 true-to-scale prints of the full-size and half-scale drawings of the W.1.A. engine.

UHL, CHARLES C.: A folder of newspaper clippings on Carl Ben Eielson.

VERVILLE, ALFRED V., San Diego, Calif.: Blueprint of Curtiss TS–1, one sheet, plan view only, scale 1½" to the foot, made by the Navy Department, Bureau of Construction and Repair.

VON MEISTER, F. W., MAYBACH MOTOR CO., New York, N.Y.: 13 original photos of the LZ–127 Graf Zeppelin.

WATERMAN, WALDO D., San Diego, Calif.: 1 file folder of biographical and Early Bird material: 21 blueprints of Waterman W–4 airplane; 13 original tracings; 1 set of erection drawings for JN4D; 19 miscellaneous photos of W–4 airplane; 1 wire bracing diagram of JN4D from Payne Field.

WERTHEIM ADVERTISING ASSOCIATION, New York, N.Y.: Print, black and white, 8½" x 11", titled "Emanuel Swedenborg," showing that Swedish philosopher seated and holding a quill pen in act of writing.

WIEGMAN, C. H., LYCOMING DIVISION OF AVCO MANUFACTURING CORP., Williamsport, Pa.: Test of Diesel Power, Inc., diesel conversion of the Lycoming 0–290–1 engine (December 1948).

WRIGHT, DR. THEODORE P., Ithaca, N.Y.: 3-volume set of articles and addresses of Dr. Wright.

ZONTA INTERNATIONAL, Chicago, Ill.: A poster, reprint of biographical article, and a copy of "The Zontian," describing the Amelia Earhart scholarships established by this organization of executive and professional women.

ACCESSIONS

Additions to the National Aeronautical and Space collections received and recorded during the fiscal year 1962 totaled 137 specimens in 81 separate accessions, as listed below. Those from Government departments are entered as transfers unless otherwise indicated; others were received as gifts or loans.

ABBOTT, DR. IRA H., Washington, D.C.: Oil portrait of Dr. Joseph S. Ames. (N.A.M. 1294.)

AIR FORCE, DEPARTMENT OF THE, BOLLING AIR FORCE BASE, Washington, D.C.: Air Force Douglas C–54 "Sacred Cow," Presidential aircraft (N.A.M. 1285).

AIR FORCE MUSEUM, Dayton, Ohio: Group of six aerial cameras; four American, one German, and one Japanese (N.A.M. 1309); North American F–86A Fighter aircraft (N.A.M. 1296).

AVCO MANUFACTURING CORP., LYCOMING DIVISION, Stratford, Conn.: T–53–L–1, Shaft-turbine helicopter engine. (N.A.M. 1326.)

BEECH AIRCRAFT CORP., Wichita, Kans.: Models of the Beech 65 and L-23D aircraft. (N.A.M. 1265.)

BELLANCA, MRS. GIUSEPPI, Galena, Md.: Bellanca CF airplane and an Anzani 3-cylinder aircooled radial engine. (N.A.M. 1259.)

BLODGETT, CHARLES L.: Sample of RPI rocket fuel taken from Thor missile just before launch of first Pioneer space probe. (N.A.M. 1295.)

BOYD, G. N., Brielle, N.J.: A 6-cylinder 1911 Kirkham aircraft engine which was used to fly at least 5 different airplanes in 1911 and 1912. (N.A.M. 1282.)

BURNELLI, V. J., Washington, D.C.: Wind-tunnel model of Burnelli Loadmaster, 1:12 size. (N.A.M. 1312.)

CADY, DR. GEORGE, Seattle, Wash.: Tube of helium from Navy's first helium-filled airship and one tube of gas from well in Kansas where helium was discovered in 1905. (N.A.M. 1311.)

CHENNAULT, MRS. CLAIRE, Washington, D.C.: Oil portrait of Gen. Claire Chennault painted by Y. T. Lin of Taipei, Taiwan. (N.A.M. 1297.)

COFFYN, MRS. FRANK T., Palo Alto, Calif.: Pilot's license No. 26 issued by Aero Club of America to Frank T. Coffyn and Helicopter certificate No. 3. (N.A.M. 1329.)

COLE, MARCH G., Merrimac, Mass.: Stock certificates and circulars issued by Aerial Navigation Co. in 1851. (N.A.M. 1269.)

CRAUN, BERNARD, Arlington, Va.: Radio receiving set for use in aircraft during WW–I, complete with leather helmet and built-in headset. (N.A.M. 1317.)

CRELLY, MR. AND MRS. H. J., College Park, Md.: Two Wright airplane wheels, one Paragon propeller, and one book of airmail covers—all associated with the donor's personal acquaintance with early aviation history at the College Park airfield. (N.A.M. 1306.)

CUSTER, W. R., Hagerstown, Md.: Prototype of the Custer Channel-wing aircraft. (N.A.M. 1261.)

DRIGGS, MRS. IVAN, Washington, D.C.: Model of Driggs Dart and computer. (N.A.M. 1328.)

DITTENBERGER, RICHARD, Parma, Ohio: Model of the Lockheed U–2 Reconnaissance aircraft. (N.A.M. 1293.)

EARLY BIRDS, THE, Fairfield, Conn.: Bronze plaque commemorating Glenn Curtiss first solo (N.A.M. 1333); bronze plaque containing the names of all members, past and present, of the donating organization (N.A.M. 1322).

ECKER, HERMAN A., Fort Lauderdale, Fla.: Curtiss-type flying boat built and flown by donor. (N.A.M. 1313.)

FILIPPI, BERNARD P., Baltimore, Md.: Pastel portrait of Charles A. Lindbergh painted in 1956 by Rosemary Mahoney. (N.A.M. 1302.)

FLAMMER, CAPT. PHILIP M., Colorado Springs, Colo.: Helmet which was taken from dead body of Raoul Lufbery after his tragic death in combat in WW–I. (N.A.M. 1267.)

FLEET, MAJ. REUBEN H., San Diego, Calif.: Scale model of Consolidated NY–2 as flown by James Doolittle in his famous "under the hood" blind flight, Sept. 29, 1929. (N.A.M. 1307.)

FRANKEL, ARTHUR G., Little Rock, Ark.: Letter and envelope sent to donor on first air mail, May 15, 1918. (N.A.M. 1320.)

GAFFNEY, JAMES F., Cleveland, Ohio: Scale model of the Japanese Army "Nick," Kawasaki two-place twin-engined long-range day and night fighter, used in WW–II. (N.A.M. 1332.)

GENERAL DYNAMICS CORP., Washington, D.C.: One scale model of a Convair Atlas-E satellite launching vehicle. (N.A.M. 1330.)

GENERAL MOTORS, ALLISON DIVISION, Indianapolis, Ind.: Cutaway specimen of the Allison 501 Turboprop engine mounted for display (N.A.M. 1303); OLDS-

MOBILE DIVISION, Lansing, Mich.: Rotor assembly for the J 65–B–3 Sapphire turbojet engine. (N.A.M. 1283.)

GLEICK, J. T., Morton Grove, Ill.: Stabilizer brace wire fitting whose failure caused termination of world endurance flight of Jackson and O'Brine in 1929. (N.A.M. 1324.)

GROENHOFF, HANS, Miami Beach, Fla.: Purchase of photo negative collection. (N.A.M. 1300.)

GRUMMAN AIRCRAFT CO., Bethpage, N.Y.: Models of Grumman Aircraft F–11–F, WF–2, and S2F–1. (N.A.M. 1316.)

HARLANDER, A. C., Oakland, Calif.: WW–I memorabilia including navigation chart, fur-lined goggles, carrier pigeon message capsule, Very signal pistol, and two rolls of aerial gunnery film. (N.A.M. 1281.)

HARTWICK, HERBERT D., La Crescenta, Calif.: Model of Ford 4AT–B Trimotor (purchase). (N.A.M. 1315.)

HAYWARD, JOHN B., Washington, D.C.: Original letter written by Orville Wright to Otto T. Mallery, Nov. 9, 1933. (N.A.M. 1289.)

HEIN, ARNOLD: Skeletonized model of the Fokker D VII World War I single seat fighter. (N.A.M. 1292.)

HILL, C. R., Grafton, Ohio: Carburetor for Curtis OX–5 engine. (N.A.M. 1286.)

HOCK, CHARLES F., Allentown, Pa.: Falcon propeller used on early Navy trainers. (N.A.M. 1304.)

JACOBS, MRS. RUTH A., Dayton, Ohio: Early 4-cylinder Wright Brothers engine. (N.A.M. 1273.)

JET PROPULSION LABORATORY, Pasadena, Calif.: Instrument duplicates of the Pioneer IV, Lunar Space Probe, and the Explorer I, America's first satellite (N.A.M. 1262); fully instrumented flight-spares of the satellite Explorer I. (N.A.M. 1271.)

KERWOOD, COL. CHARLES, Washington, D.C.: Trophy of the Ligue Internationale des Aviateurs, founded in 1926 by Col. Clifford Burke Harmon, pioneer American balloonist and aviator. (N.A.M. 1287.)

MARR, CAPT. GIFFEN A., Fort Leonard Wood, Mo.: Three flight instruments recovered from the B–24 Bomber "Lady Be Good" after 16 years. (N.A.M. 1270.)

MARTIN-MARIETTA CORP., Baltimore, Md.: Models of Martin aircraft and experimental projected aircraft of the Martin Co. (N.A.M. 1290.)

MCKNEW, DR. THOMAS W., Washington, D.C.: The General Thomas D. White Air Force Space Trophy. (N.A.M. 1280.)

MEYER, CORD, New York, N.Y.: Portion of side fuselage fabric from the DH–4, the first American-built DH to see combat in WW–I. (N.A.M. 1284.)

MOORE, MAJ. GEOFFREY, Bath, England: WW–I Anti-zeppelin exposive dart. (N.A.M. 1274.)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, Washington, D.C.: "Freedom 7" Mercury Spacecraft which carried Alan Shepard on U.S. First Space Flight and an astronaut space suit. (N.A.M. 1264.)

NASH, MISS CAROLYN, Washington, D.C.: Fragment of a parachute reported to be associated with the 1925 expedition of Roald Amundsen and his companions who endeavored to fly to the North Pole in two Dornier flying boats, departing Spitzbergen May 21, 1925. (N.A.M. 1334.)

NATIONAL HISTORICAL WAX MUSEUM, Washington, D.C.: Plastic display head of Comdr. Alan B. Shepard made to fit into the Space Helmet and Suit to be displayed with the "Freedom 7" Mercury Capsule. (N.A.M. 1266.)

NAVY, DEPARTMENT OF THE, Washington, D.C.: Polaris, the Nation's first large solid propellant ballistic missile, and the first designed to be fired by ships at sea. (N.A.M. 1260.) NAVAL ACADEMY, Annapolis, Md.: Engine from

Japanese Ota kamikaze attack plane. (N.A.M. 1277.) NAVAL RESEARCH LABORATORY, Washington, D.C.: 16-mm. movie camera which took pictures of the earth from 100 miles altitude in 1954; also a copy of the film and a mosaic picture, using 180 frames from the film. (N.A.M. 1276.) BUREAU OF WEAPONS, Washington, D.C.: Full-size replica of Curtiss A–1, the Navy's first aircraft (N.A.M. 1275); Mitsubishi Airplane, A6M5 "Zero" (N.A.M. 1305.) U.S. MARINE CORPS, Quantico, Va.: Ordnance materiel for installation on Museum specimens. (N.A.M. 1263.)

NEUMANN, CHARLES L., Tulsa, Okla.: A complete Mark I Sperry Automatic Direction Finder unit, one of the first to be used by the airlines in the 1930's. (N.A.M. 1298.)

NEVIN, ROBERT S., Denver, Colo.: Scale model of the Curtiss twin-tractor flying boat of 1912 (purchase). (N.A.M. 1201.)

PARSONS, REAR ADM. EDWIN C., Osprey, Fla.: Fragment of first American flag to be flown over German lines on day America entered WW–I. (N.A.M. 1278.)

PIONIERI DELL 'AERONAUTICA, Rome, Italy: Life-size bronze busts of the pioneer Italian flyers Mario Calderara and Umberto Savoia. (N.A.M. 1321.)

POPULAR MECHANICS MAGAZINE, CLIFFORD HICKS, EDITOR, Chicago, Ill.: 12 watercolor paintings by Korta, of the "Twelve Most Significant Aircraft of All Time." (N.A.M. 1327.)

PROCTOR, ELBERT W., Takoma Park, Md.: Pilot's flight gear used by donor as a pilot for National Air Transport in late 1920's. (N.A.M. 1255.)

RANDALL, W. D., Jr., Orlando, Fla.: Duplicate of hand-wrought knife carried in "Freedom 7" Mercury spacecraft on its famous flight. (N.A.M. 1254.)

ROCKWELL, COL. PAUL A., Asheville, N.C.: French uniform worn by the donor's brother, Kiffin Rockwell, as a pilot in the WW–I Lafayette Escadrille, together with copies of the eight medals awarded to the deceased. (N.A.M. 1323.)

SCALE CRAFT MODELS, Massillon, Ohio: Model of a Curtiss HS2L Flying Boat, WW–I, U.S. Navy patrol craft (purchase). (N.A.M. 1310.)

SIMPSON, COL. DONALD P., Teheran, Iran: German WW–II Navigation Kit. (N.A.M. 1279.)

SIX, ROBERT F., Denver, Colo.: Original watercolor painting entitled "Beech Aircraft in Flight," by Alfred Owles. (N.A.M. 1318.)

SMITHSONIAN INSTITUTION, Washington, D.C.: Original letter written by Wilbur Wright to the Smithsonian on May 30, 1899, requesting available information on flight (N.A.M. 1301); flag taken from L–49 German Zeppelin and fragments of outer and inner bag of craft (N.A.M. 1268).

SOUBIRAN, MRS. ROBERT, Washington, D.C.: Memorabilia of donor's husband's service in the Lafayette Escadrille. (N.A.M. 1256.)

STEMP, MR. AND MRS. RONALD F., Annapolis, Md.: Wooden aircraft propeller of the middle 1920's presented to donor by Col. A. A. Anderson, a partner in the Bellanca Airplane Co. (N.A.M. 1308.)

SWEDENBORG FOUNDATION, INC., New York, N.Y.: A scale model of the concept of an aircraft by Emanuel Swedenborg, Swedish philosopher, engineer, and theologian who conceived this aircraft about 1714. (N.A.M. 1290.)

THENAULT, MME. GEORGES, Paris, France: Two-volume diaries "Journal des Marches et Operations" kept by Capt. Georges Thenault, the French Commander of the Lafayette Escadrille. (N.A.M. 1272.)

TRACY, DANIEL, Lakewood, Ohio: Model of Curtiss R–1 Pulitzer Prize winner of 1921 aircraft (purchase) (N.A.M. 1257); scale model of the French Nieuport-Delage–29 airplane, the final winner of the James Gordon Bennett Trophy, 1920 (purchase) (N.A.M. 1331).

UNITED AIRCRAFT CORP., Hartford, Conn.: The Igor Sikorsky International Trophy awarded for outstanding achievement in the helicopter field (N.A.M. 1325). PRATT & WHITNEY DIVISION: Two-throw crankshaft for Pratt & Whitney R-2800 engine (N.A.M. 1258).

UNITED AIRLINES, Chicago, Ill.: Models of Douglas DC-6, DC-7 and Boeing Stratocruiser 277. (N.A.M. 1314.)

WEEMS, CAPT. P. B. H., Annapolis, Md.: A Japanese cargo WW-II parachute. (N.A.M. 1288.)

ZONTA CLUB OF WASHINGTON, Washington, D.C.: Oil painting of Amelia Earhart by Arthur Laronda. (N.A.M. 1319.)

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, 1962:

BIRTHS

The major zoological event at the National Zoological Park during the past year was the birth of a male lowland gorilla on September 9, 1961. The parents, Nikumba and Moka, were brought from French Equatorial Africa (now Congo) by the Arundel Expedition in February 1955; at that time their age was estimated to be 18 months for the male and 20 months for the female. During the last weeks of the 9-month pregnancy an hourly check was made on the gorilla cage, but the actual birth was not observed. The baby was discovered by a night keeper at 6:58 a.m. As Moka showed no maternal interest in her infant, it was removed from the cage and taken to the home of Bernard Gallagher, supervisory keeper of great apes, where Mrs. Gallagher reared it along with a 5-month-old chimpanzee. On April 24, after more than 7 months with the Gallaghers, Tomoka and his chimpanzee companion, Lulu, were brought to the Zoo and put on exhibition April 24.

Radio Station WAVA, Arlington, Va., owned by Arthur Arundel, who had originally escorted Nikumba and Moka from Brazzaville to Washington, held a contest to select a name for the baby, and the naming ceremony was broadcast on April 24.

Tomoka is the second gorilla born in captivity in the United States and the fourth bred, born, and raised in captivity in the world. Comparing the development of this gorilla with the statistics available of those born elsewhere (Columbus, Ohio, and Basel, Switzerland), the most outstanding difference appears to be the early date at which upper and lower incisors erupted. In Goma, the female gorilla reared in the home by Dr. Lang in Basel, under similar conditions to ours, the first breakthrough of the incisors was observed at the age of 2 months, and at the age of 6 months four lower and two upper incisors were reported. As indicated in the accompanying table, Tomoka's lower median left incisor broke through on October 3, 25 days after birth, and the lower median right on October 5, 27 days after birth. Both median upper incisors were showing 35 days after birth, and at the end of 66 days all eight incisors had erupted.

ERUPTION OF DECIDUOUS TEETH

[In days]

Average chimpanzee*	308	126		122	111				*Maxilla*			
Average human*	839	486		316	277							
Goma					68	74						
Tomoka	175	111		61	51	55	61		111	175		
	m_1	pm_2	pm_1	c	i_2	i_1	i_1	i_2	c	pm_1	pm_2	m_1
Tomoka	183	145			68	25	27	79		141	183	
Goma					90	60	59	90				
Average human*	787	492			395	222						
Average chimpanzee*	247	150			124	95			*Mandibula*			

*Ref: E. Boyd, L. B. Higley, E. H. Hixon, V. O. Hurme, M. Massler, H. V. Meredith, A. H. Riesen, A. H. Schultz (Zurich).

Tomoka's weight curve appears to ascend a little more rapidly than that of Goma, while Tomoka's growth curve levels off at an earlier date than Goma's.

Except for an early rhinal and bronchial cold and occasional diarrheas, mostly during dentition periods, no major upsets occurred in Tomoka's early life, and the baby at present gives all indications of being sound, healthy, and both mentally and physically well developed. Special mention should be made of the ceaseless effort of Mrs. Louise Gallagher, who proved to be an extremely reliable, conscientious, and dedicated foster mother.

Among other important births at the Zoo was that of an F2 Dorcas gazelle fawn, as well as a male fawn from the mother originally donated by President Bourguiba of Tunisia in 1960, bringing the number of this little herd up to five.

The birth of a male ring-tailed lemur (*Lemur catta*) on April 21, 1962, appears to be the first in this country since 1914 when the Philadelphia Zoo recorded a *Lemur catta* born, but did not note whether it was bred in captivity.

For the first time in this Zoo, lesser pandas were born—twins, a male and a female, on June 20. They were approximately 4 inches long, weighed about 4 ounces, and were nursed by the mother.

The Australian kookaburra laid a total of six eggs in two clutches, and five young were successfully raised.

The exchange of the old black swan cob for a new one resulted in two clutches of eggs, four and six, respectively. Out of the first, one cygnet was hatched in the incubator, while in the second clutch all six cygnets were hatched and brooded by the mother.

Following the procedure of previous years, all births and hatchings are listed below, whether or not the young were successfully raised.

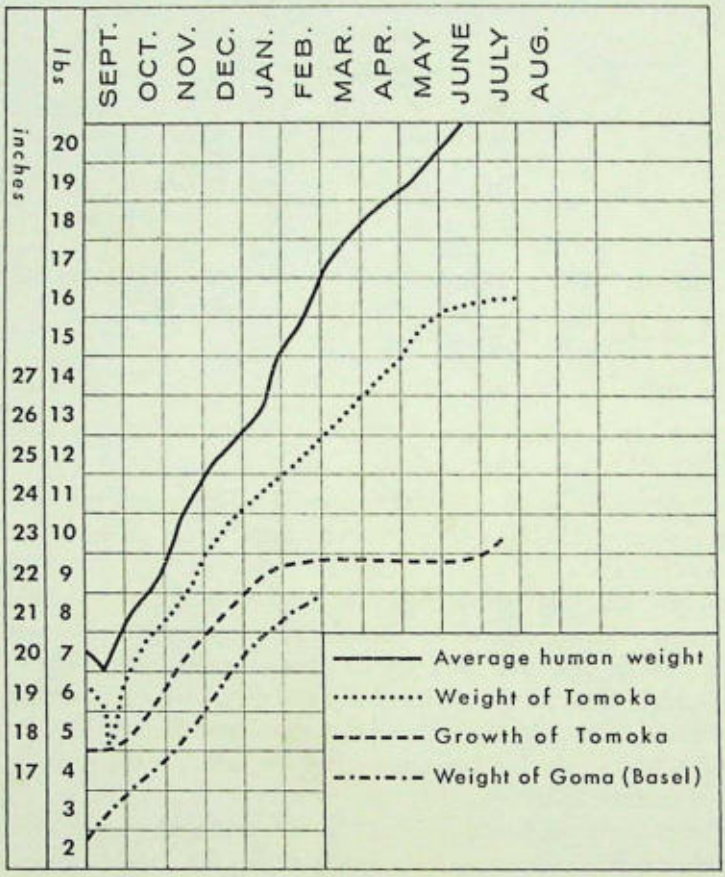

FIGURE 1.—Growth and weight graph of Tomoka compared with the average human weight and the weight of Goma.

In many instances the record of animals having bred in captivity is of importance.

MAMMALS

Common name	*Scientific name*	*Number*
Australian sugar glider	*Petaurus breviceps*	1
Rat kangaroo	*Potorous* sp.	2
European hedgehog	*Erinaceus europaeus*	4
Ring-tailed lemur	*Lemur catta*	1
Galago	*Galago crassicaudatus*	1
Brown capuchin	*Cebus* sp.	1
Black spider monkey	*Ateles geoffroyi*	1
Black spider monkey	*Ateles fusciceps*	*1
Pygmy marmoset	*Cebuella pygmaea*	1
Hybrid macaque	*Macaca philippinensis* × *M. irus.*	1
Barbary ape	*Macaca sylvanus*	3

*Stillborn.

Tomoka, male lowland gorilla, when 4 days old. National Zoological Park.

Tomoka at 11 months, playing in his cage. National Zoological Park.
Photograph by T. W. Roth.

1. Baby lesser pandas bred and born in the National Zoological Park.
Photograph by T. W. Roth.

2. Baby *Lemur catta*, bred and born in the National Zoological Park, with its mother
Photograph by T. W. Roth.

1. The male saiga antelope wears a piece of rubber hose on each horn to prevent damage to the female. National Zoological Park. Photograph by T. W. Roth.

2. A 15-foot king cobra arrived from Thailand during the current year. National Zoological Park. Photograph by Chinn, Washington Evening Star.

Common name	Scientific name	Number
Sooty mangabey	*Cercocebus fuliginosus*	1
Hybrid gibbon	*Hylobates agilis* × *H. lar pilcatus.*	1
Chimpanzee	*Pan satyrus*	*1
Lowland gorilla	*Gorilla gorilla*	1
Two-toed sloth	*Cholocpus didactylus*	1
Prairie-dog	*Cynomys ludovicianus*	5
Patagonian cavy	*Dolichotis patagona*	2
Timber wolf	*Canis lupus nubilus*	*1
Cape hunting dog	*Lycaon pictus*	4
Korean bear	*Selcnarctos thibctanus ussuricus*	1
European brown bear	*Ursus arctos*	2
Hybrid bear F2	*Thalarctos maritimus* × *Ursus middendorffi.*	*2
Grizzly bear	*Ursus horribilis*	*1
Lesser panda	*Ailurus fulgens*	2
Neumann's genet	*Genetta genetta neumannii*	2
Formosan spotted civet	*Viverricula indica*	1
African water civet	*Atilax paludinosus*	2
Black leopard	*Panthera pardus*	*1
African lion	*Panthera leo*	4
Grant's zebra	*Equus burchelli bochmi*	2
Collared peccary	*Pecari tajacu*	3
Nile hippopotamus	*Hippopotamus amphibius*	1
Llama	*Lama glama*	2
White fallow deer	*Dama dama*	1
Axis deer	*Axis axis*	3
Red deer	*Cervus claphus*	1
Elk	*Cervus canadensis*	1
Sika deer	*Cervus nippon*	6
Virginia deer	*Odocoilcus virginianus*	2
Reindeer	*Rangifer tarandus*	2
Dorcas gazelle	*Gazella dorcas*	2
Aoudad	*Ammotragus lervia*	*1
Big-horned sheep	*Ovis canadensis*	1
BIRDS		
Black swan	*Chenopis atrata*	7
Wood duck	*Aix sponsa*	75
Mallard duck	*Anas platyrhynchos*	25
Mandarin duck	*Dendronessa galericulata*	1
Red junglefowl	*Gallus gallus*	1
Peafowl	*Pavo cristatus*	4
Indian emerald-winged tree dove	*Chalcophaps indica*	1
Leadbeater's cockatoo	*Kakotoe leadbeateri*	1
Grass parakeet	*Melopsittacus undulata*	2
Kookaburra	*Dacelo gigas*	6
REPTILES		
Box turtle	*Terrapene carolina*	1
Painted turtle	*Chrysemys picta*	4
Red-lined turtle	*Pseudemys scripta callirostris*	2

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Common name	Scientific name	Number
Yellow-bellied turtle	*Pseudemys scripta scripta*	5
Red-eared turtle	*Pseudemys scripta elegans*	4
Red-bellied turtle	*Pseudemys rubriventris*	2
Cook's tree boa	*Boa cnydris cooki*	18
Eastern garter snake	*Thamnophis sirtalis*	30
Eastern ribbon snake	*Thamnophis sauritus*	6
Black racer	*Coluber constrictor*	24
Corn snake	*Elaphe obsoleta guttata*	6
Northern copperhead	*Ancistrodon contortrix*	8
Western diamondback rattlesnake	*Crotalus atrox*	7
FISHES		
Egyptian mouthbreeder	*Haplochromis multicolor*	30

GIFTS

Gifts from foreign dignitaries again enriched the National collection. President William V. S. Tubman of Liberia, making an official visit to Washington, spent 2 hours in the Zoo on September 13 and presented a leopard. President Ibrahim Abboud of Sudan came to the Zoo on October 5 and donated four demoiselle cranes and two migratory cranes, which were welcome additions to the collection.

"Ambika," the Indian elephant which was a gift from the "Share Your Birthday Foundation" and the Maharajah of Mysore, came to the Zoo on deposit April 14, 1961. After touring the country and making appearances at schools and playgrounds, she was formally presented to the Zoo on January 5, 1962. A. K. Ray, first secretary of the Indian Embassy, the Secretary of the Smithsonian Institution, and Mrs. Ira J. Heller, president of the Share Your Birthday Foundation, were all present at the ceremony.

In return for a pygmy hippopotamus, given last year by President Tubman of Liberia, the National Zoological Park sent a trio of American bison to the zoo in Monrovia. The shipment was accompanied by Charles Thomas, senior keeper.

Dr. R. E. Kuntz sent a valuable collection of reptiles (listed below), and J. E. Joy, who has sent interesting specimens in the past, gave his entire collection of western reptiles.

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

Brown, Comdr. L. L., Takoma Park, Md., hill mynah.
Browne, Mrs. Elwyn, Seat Pleasant, Md., kinkajou.
Cline, Martin J., Bethesda, Md., 4 alligators.
DePrato, Mario, Kensington, Md., coral snake, sand boa.
Eccard, Elliott, Bethesda, Md., Petz's parakeet.
Evans, Wallace L., Richmond, Va., boa constrictor.
Fish and Wildlife Service: through Dr. A. S. Mosby, Blacksburg, Va., broad-winged hawk; Cambridge, Md., 2 whistling swans; through Dr. Gordon Clark,

Chincoteague, Va., 4 snowy egrets, 4 little blue herons, herring gull, 4 common terns, 14 American egrets, 6 laughing gulls, 5 Louisiana herons, 6 skimmers, 4 ospreys, 2 eastern green herons; Wildlife Refuge, Patuxent, Md., 2 ovenbirds, 2 Acadian flycatchers, red-eyed vireo, 3 cardinals, 20 wood thrushes, 5 scarlet tanagers, 2 Kentucky warblers, redstart; through R. Halstead, Washington, N.C., 3 pintail ducks, 3 black ducks, 4 mallard ducks, 6 wood ducks, green-winged teal, 3 whistling swans.

Franklin Park Zoo, Boston, Mass., 3 pygmy goats.

French Creek Game Farm, French Creek, W. Va., 2 American black bears, 2 southern fox squirrels, 8 timber rattlesnakes.

Hoffman, Charles R., Washington, D.C., American bittern.

Holmes, Mrs. Dorothy, Arlington, Va., Petz's parakeet.

Hood, Capt. G. H., U.S.S. *Hermitage*, African ball python, Nile crocodile.

Hower, Lt. S. H., Washington, D.C., mute swan.

Johnson, Alex R., San José, Costa Rica, ocelot.

Jones, Thomas R., Arlington, Va., 3 timber rattlesnakes.

Joy, J. E., San Angelo, Tex., 3 crevice spiny lizards, 2 flat-headed snakes, western hog-nosed snake, 2 rough green snakes, 2 Sonoran king snakes, 2 bull snakes, Lindheimer's rat snake, 2 Great Plains rat snakes, 3 Texas long-nosed snakes, Texas soft-shelled turtle, broad-banded copperhead, northern copperhead, 7 Western diamondback rattlesnakes, 14 Texas horned lizards, 10 collared lizards, 5 Texas spiny lizards, diamondback water snake, 2 race runners, 3 Western coachwhips, 2 Brazos water snakes, 5 short-lined skinks, 2 water snakes, black-necked garter snake.

Kuntz, Dr. R. E., Taipei, Taiwan, 2 Asiatic crested porcupines, 5 lesser Indian rat snakes, 3 Formosan green snakes, 32 palm vipers (of 2 species), 4 Taiwan habus, 4 Formosan rat snakes, 2 Russell's vipers, 9 many-banded kraits, 5 Taiwan cobras, 5 greater Indian rat snakes, 5 Formosan striped rat snakes, 6 striped keel-backed water snakes, Oshima rat snake, 4 Philippine monitors, 3 regal pythons, 10 Tokay geckos.

Latham, Mrs. Inez, Washington, D.C., 2 Bengalee finches, 2 cut-throat finches, 2 Indian silverbills.

Lewis, Dr. T. H., Bethesda, Md., 5 teeid lizards.

Montana State Game Commission, Helena, Mont., 2 Rocky Mountain goats.

Mullinax, Mrs. Lois, Takoma Park, Md., green monkey.

National Institutes of Health, Bethesda, Md., 10 deer mice (including 2 albinos), meadow vole, 6 Egyptian spiny mice, 9 African grass mice, 2 Egyptian gerbils.

Owens, Charles H., Woodbridge, Va., 3 green guenons.

Pesacane, A., Silver Hill, Md., toucan.

Ratliff, Lester, Washington, D.C., regal python, alligator.

Roth, T. H., Washington, D.C., 14 hinged-back tortoises (of 2 species), gelada baboon, green guenon, leopard tortoise, 12 vitelline masked weavers.

Rothrock, Mrs. Grace E., Washington, D.C., double yellow-headed parrot.

Schein, Steven, Silver Spring, Md., Cook's tree boa, boa constrictor, Florida king snake, spectacled caiman.

Setzer, Dr. Henry, Washington, D.C., desert hedgehog.

Sinclair, Miss Glenn, Hampton, Va., 3 gray foxes.

Skeels, Reginald V., Alexandria, Va., lesser hill mynah.

Van Doren, F. S., Manassas, Va., lesser hill mynah.

Voorhees, Alan, Bethesda, Md., mute swan.

Walter, Garvin J., Jr., Washington, D.C., keel-billed toucan.

Zander, Mrs. R. V., Alexandria, Va., cockatiel.

PURCHASES

Among important purchases of the year were a female African rhinoceros obtained as a mate for the male acquired last year, two female Masai giraffes (*Giraffa camelopardalis tippelskirchi*), the rare (in captivity) East African golden cat (*Felis* (*Profelis*) *aurata pallida*), a magnificent specimen of honey badger or ratel (*Mellivora capensis*), four saiga antelopes, and a trio of African jumping hares well adjusted to captivity and very rarely exhibited in zoos.

A shipment from Thailand yielded two open-billed storks (*Anastomas lamelligerus*) and one Feilden's falconet (*Neohyrax cinereiceps*), believed to be the only one at present in captivity in the United States.

The reptile collection was increased by two magnificent specimens of king cobra, the larger of which measures a good 16 feet. When word was received that these snakes had arrived at Idlewild Airport on a cold February day, senior keeper Mario DePrato made a quick trip to New York to receive them and bring them back to the Zoo. They were put in a safe place for the night and unpacked the following day.

Dr. W. T. Roth, general curator, while in India purchased an interesting collection of small birds; and J. Lear Grimmer, associate director, during his field trip in British Guiana purchased four white-faced saki monkeys and an assortment of small mammals, birds, and reptiles.

Other purchases of interest were:

Clouded leopard
Martial eagle
Hooded vulture
White-backed vulture
Long-crested hawk eagle
3 pygmy cormorants
4 African gray parrots
Hoopoe
2 Gaboon vipers
4 African clawed frogs
2 Blumberg's toads
18 Tokay geckos
2 Kori's bustards

EXCHANGES

An arrangement with the British Guiana Zoo, Georgetown, B.G., resulted in an exchange in which a surplus lion cub belonging to the National Zoological Park was offered for 56 birds indigenous to South America, 14 mammals, and 2 snakes.

During the course of his studies of the hoatzin in British Guiana Mr. Grimmer collected 63 birds and 34 reptiles for the Zoo. Among the birds was a small parrot (*Conurus solstitialis*). There are no records of this species ever having previously been in captivity in zoos of the United States.

Other animals obtained through exchange were:

Barcelona Zoo, Barcelona, Spain, 2 Goliath frogs.
Catskill Game Farm, Catskill, N.Y., llama.

Franklin Park Zoo, Boston, Mass., 2 Abyssinian ground hornbills.
George's Pet Shop, Bladensburg, Md., 2 spiny-tailed iguanas, 2 emerald tree boas, 2 razor-billed toucanets.
Gorsuch, George W., New Windsor, Md., 2 Egyptian geese.
Hanson, Charles, Athens, Ohio, Texas gopher snake, desert tortoise, 2 island water snakes, 3 garter snakes (melanistic phase), 6 gray tree frogs.
McCrossin, B., Washington, D.C., Egyptian goose.
Norfolk Zoo, Norfolk, Va., 4 coatimundis, 2 American bison.
Portland (Oreg.) Zoo, 2 siamangs, 3 Columbian ground squirrels.
Royal Zoological Society of Scotland, Edinburgh, 2 gannets.
San Antonio Zoo, San Antonio, Tex., jungle cat, tassel-eared squirrel.
Southwick Game Farm, Blackstone, Mass., 2 saddle-billed storks, mute swan, 2 tricolored squirrels.
Thomas, Charles, Washington, D.C., 2 European songthroats, 2 European buntings, 8 European linnets.
Tote-em-In Zoo, Wilmington, N.C., 4 European red squirrels, 2 murine opossums, 2 pygmy marmosets, chicken turtle, chicken snake, 2 South African spiny lizards, 2 plated lizards, 2 Ameiva lizards, 4 crested basilisks, 4 South American tortoises, 4 Florida box turtles, 2 Texas tortoises, African mud turtle, 12 day geckos (3 species of *Phelsuma*), mabuya, 4 lizards (*Hoplurus saxicola*), skink (*Zonosaurus aeneus*), 3 skinks (*Z. madagascariensis*).
Zinner, Hermann, Vienna, Austria, 7 Aesculapian snakes, 3 European racers, 4 European grass snakes, 6 tessellated water snakes, 14 water terrapins, 10 tree frogs, 4 spadefoot toads, 21 green lizards, 2 malpolons, 4 European vipers.
Zoological Society of Trinidad, Port-of-Spain, Trinidad, South American racer, rainbow boa, 10 Ameiva lizards, boa constrictor, 2 boat-billed herons, 6 scarlet ibis, 4 maroon tanagers, 2 palm tanagers, 6 blue tanagers, 6 kiskadee flycatchers.

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

Buffalo Society of Natural Sciences, Buffalo, N.Y., tree boa.
Calgary Zoo, Calgary, Alberta, European brown bear.
Chicago Zoological Society, Brookfield, Ill., Dall sheep (traded a female for a male; sent female for breeding).
Cincinnati Zoo, Cincinnati, Ohio, llama.
Fort Worth Zoo, Fort Worth, Tex., harpy eagle.
Franklin Park Zoo, Boston, Mass., serval kitten, black-backed jackal, black spider monkey, 3 fat-tailed gerbils.
George's Pet Shop, Bladensburg, Md., 2 yellow-necked parrots.
Hanson, Charles, Athens, Ohio, corn snake, American alligator.
Houston Zoo, Houston, Tex., 2 woodchucks, 3 Egyptian spiny mice, 2 fat-tailed gerbils, 2 Meriones, 3 Neumann's genets, 2 water civets, night monkey, hybrid gibbon, 3 brown-throated conures, 4 tawny-bellied seedeaters.
McCrossin, B., Washington, D.C., 2 onogadori chickens, ring-necked dove.
Norfolk Zoo, Norfolk, Va., llama, African porcupine.
Oakie, W. A., Winston-Salem, N.C., 4 mute swan cygnets, 2 whooper swan cygnets.
Philadelphia Zoo, Philadelphia, Pa., American crocodile.
San Antonio Zoo, San Antonio, Tex., African crowned crane, raccoon dog, jungle cat, spider monkey, 2 sooty monkeys, gelada baboon, 4 black squirrels, 4 fat-tailed gerbils.
Southwick Wild Animal Farm, Blackstone, Mass., emu, black swan, 2 wild turkeys.

Steinhart Aquarium, San Francisco, Calif., 2 Surinam toads.
Thomas, Charles, Washington, D.C., 2 cockatiels.
Toledo Zoo, Toledo, Ohio, 2 Cape hunting dogs.
Tote-em-In Zoo, Wilmington, N.C., 4 Virginia deer, collared peccary, 4 American black bears, 3 olive baboons, 2 leopards, 5 Sika deer.
Werber, S. F., Silver Spring, Md., 1 Canada goose.

The associate director, J. Lear Grimmer, and Mrs. Grimmer returned to British Guiana to continue investigation into the ecology of the hoatzin (*Opisthocomus hoatzin*). Certain observations of the bird in former years made it desirable to have a morphologist-anatomist on the expedition, and Dr. Wilhelm Marinelli, professor of zoology and director of graduate biology, University of Vienna, was invited to participate in view of his longstanding interest in the species. After spending 10 weeks in field work throughout British Guiana, Mr. Grimmer and Dr. Marinelli assembled and studied their findings for 2 months at the University of Vienna, correlating behavior patterns and anatomical aspects of the bird.

One of the hoatzins brought to the National Zoo established an important longevity record. Captured July 10, 1961, it lived until January 25, 1962—long enough to make close-range daily observations possible. Much was learned of its adaptability to cage environment and food requirements. The field work will continue with an ultimate goal of establishing an integrated breeding colony of this extraordinary bird in the National Zoological Park.

The expeditions have been sponsored by the Smithsonian Institution, the National Geographic Society, the Mitch Miller Foundation, and the Jewett Foundation. An article on the work done in British Guiana will be published in the October 1962 National Geographic Magazine.

General improvements and innovations in the animal department included experimental reversed daylight setups. Also an attempt was made to winter more animals outdoors than previously. By providing a minimal amount of heat, through overhead lamps or underground heating cables in their shelters or sleeping boxes, gazelles and macaques were successfully wintered outdoors. Cockatoos and parakeets were given "hot-foot" perches made of pipe, through which an electric heating wire was run, controlled by a thermostat.

In the large mammal division an elephant training program was initiated in May in order to keep the young male African elephant, "Dzimbo," under control and to provide "Nancy," "Ambika," and "Shanti" with more exercise.

The commissary division increased the raising of food animals such as waxworms, crickets, mealworms, chickens, rabbits, and guinea pigs, and thereby provided a valuable addition to the diet of the animals.

The night-keepers program, while not yet completely staffed, has

proved to be a valuable development; night-time feeding and attention have contributed greatly to the number of baby animals and birds successfully raised at the Zoo.

The importance of a zoological collection rests, to a large extent, upon its diversity and scope. The National Zoological Park has enjoyed some measure of success in its efforts to add representative species belonging to little-known or absent families.

The total number of accessions for the year was 1,340. This includes gifts, purchases, exchanges, deposits, births, and hatchings.

STATUS OF THE COLLECTION

Class	Orders	Families	Species or subspecies	Individuals
Mammals	14	48	244	665
Birds	22	78	415	1,209
Reptiles	4	26	206	809
Amphibians	2	11	23	109
Fishes	4	9	21	80
Arthropods	3	5	5	57
Mollusks	1	1	1	30
Total	50	178	914	2,959

ANIMALS IN THE COLLECTION ON JUNE 30, 1962

MAMMALS

MONOTREMATA

Family and common name	*Scientific name*	*Number*
Tachyglossidae:		
Echidna, or spiny anteater	*Tachyglossus aculeatus*	1

MARSUPIALIA

Didelphidae:		
Murine opossum	*Marmosa* sp	1
	Didelphis marsupialis	1
Dasyuridae:		
Tasmanian devil	*Sarcophilus harrisii*	1
Phalangeridae:		
Sugar glider	*Petaurus breviceps*	3
Squirrel glider	*Petaurus norfolcensis*	7
Phascolomidae:		
Hairy-nosed wombat	*Lasiorhinus latifrons*	2
Mainland wombat	*Wombatus hirsutus*	1
Macropodidae:		
Tree kangaroo	*Dendrolagus matschiei*	1
Rat kangaroo	*Potorous* sp	3

INSECTIVORA

Family and common name	*Scientific name*	*Number*
Erinaceidae:		
European hedgehog	*Erinaceus europaeus*	4
African desert hedgehog	*Paraechinus aethiopicus*	1
Short-tailed shrew	*Blarina brevicauda*	2

PRIMATES

Lemuridae:		
Ring-tailed lemur	*Lemur catta*	4
Lorisidae:		
Great galago	*Galago crassicaudatus*	2
Dwarf galago	*Galago senegalensis zanzibaricus*	2
Common potto	*Perodicticus potto*	1
Cebidae:		
Night monkey	*Aotus trivirgatus*	2
Brown capuchin monkey, White-throated capuchin, Capuchin	*Cebus capucinus*	10
Weeping capuchin monkey	*Cebus griseus*	1
White-faced saki monkey	*Pithecia pithecia*	1
Squirrel monkey	*Saimiri sciureus*	6
Black spider monkey	*Ateles fusciceps*	4
Spider monkey	*Ateles geoffroyi*	6
Woolly monkey	*Lagothrix* sp	1
Callithricidae:		
Pygmy marmoset	*Cebuella pygmaea*	2
Cottontop marmoset	*Saguinus oedipus*	1
Red-handed marmoset	*Saguinus midas*	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* × *M. irus*	1
Rhesus monkey	*Macaca mulatta*	4
Formosan monkey	*Macaca cyclopis*	2
Red-faced macaque	*Macaca speciosa*	1
Barbary ape	*Macaca sylvānus*	14
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*	3
Crested mangabey	*Cercocebus aterrimus opdenboschii.*	1
Black-crested mangabey	*Cercocebus aterrimus*	2
Chacma baboon	*Papio comatus*	1
Olive baboon	*Papio anubis*	3
Gelada baboon	*Theropithecus gelada*	4
Vervet guenon	*Cercopithecus aethiops pygerythrus.*	1

Family and common name	*Scientific name*	*Number*
Cercopithecidae—Continued		
Green guenon	*Cercopithecus aethiops sabaeus*	5
Grivet guenon (color variation)	*Cercopithecus aethiops aethiops*	1
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*	2
White-nosed guenon	*Cercopithecus nictitans*	1
Lesser white-nosed guenon	*Cercopithecus nictitans petaurista.*	1
Allen's swamp monkey	*Allenopithecus nigroviridis*	2
Spectacled, or Phayre's, langur	*Presbytis phayrei*	1
Entellus, or Hanuman monkey	*Presbytis entellus*	1
Langur	*Presbytis* sp.	1
Pongidae:		
White-handed gibbon	*Hylobates lar*	5
Wau-wau gibbon	*Hylobates moloch*	1
Gibbon, hybrid	*Hylobates agilis* × *H. lar pileatus*	1
Gibbon, hybrid	*Hylobates lar* × *H.* sp.	1
Siamang gibbon	*Symphalangus syndactylus*	1
Sumatran orangutan	*Pongo pygmaeus abelii*	2
Bornean orangutan	*Pongo pygmaeus pygmaeus*	1
Chimpanzee	*Pan satyrus*	4
Gorilla	*Gorilla gorilla*	3
EDENTATA		
Myrmecophagidae:		
Giant anteater	*Myrmecophaga tridactyla*	1
Bradypodidae:		
Two-toed sloth	*Choloepus didactylus*	8
Dasypodidae:		
Nine-banded armadillo	*Dasypus novemcinctus*	1
LAGOMORPHA		
Leporidae:		
Domestic rabbit	*Oryctolagus cuniculus*	7
RODENTIA		
Sciuridae:		
Tassel-eared squirrel	*Sciurus aberti aberti*	1
Gray squirrel (albino)	*Sciurus carolinensis*	2
Sciuridae:		
Southern fox squirrel	*Sciurus niger*	3
European red squirrel	*Sciurus vulgaris*	4
Indian palm squirrel	*Funambulus palmarum*	1
Giant Indian squirrel	*Ratufa indica*	1
Tricolored, or Prevost's, squirrel	*Callosciurus prevosti*	1
Asiatic squirrel	*Callosciurus nigrovittatus*	1
Formosan tree squirrel	*Callosciurus erythraeus*	1
Woodchuck, or groundhog	*Marmota monax*	3
Prairie-dog	*Cynomys ludovicianus*	8
California ground squirrel	*Citellus beecheyi*	4

Family and common name	*Scientific name*	*Number*
Sciuridae—Continued		
Washington ground squirrel	*Citellus washingtoni*	5
Golden-mantled ground squirrel	*Citellus lateralis*	3
Eastern chipmunk	*Tamias striatus*	2
Eastern chipmunk (albino)	*Tamias striatus*	1
Yellow pine chipmunk	*Eutamias amoenus*	1
Formosan flying squirrel	*Petaurista grandis*	1
Eastern flying squirrel	*Glaucomys volans*	5
Castoridae:		
Beaver	*Castor canadensis*	2
Leporidae:		
Cape jumping hare	*Pedetes caffer*	3
Cricetidae:		
White-footed mouse	*Peromyscus* sp	7
Golden hamster	*Mesocricetus auratus*	1
East African maned rat	*Lophiomys ibeanus*	3
Pine vole	*Pitymys pinetorum*	3
Gerbil	*Gerbillus pyramidum*	16
Fat-tailed gerbil	*Pachyuromys duprasi*	30
Jird	*Meriones* sp	4
Hairy-tailed jird	*Sekeetamys calurus*	1
Muridae:		
Multimammate rat	*Mastomys natalensis*	1
Slender-tailed cloud rat	*Phloeomys cumingii*	1
Egyptian spiny mouse	*Acomys cahirinus*	14
Egyptian spiny mouse	*Acomys dimidiatus*	25
Hystricidae:		
Malay porcupine	*Acanthion brachyura*	1
African porcupine	*Hystrix galeata*	7
Asiatic crested porcupine	*Hystrix* sp	2
Caviidae:		
Patagonian cavy	*Dolichotis australis*	5
Dasyproctidae:		
Red agouti	*Dasyprocta* sp	3
Acuchy	*Dasyprocta acuchy*	2
Chinchillidae:		
Peruvian viscaccia	*Lagidium viscaccia*	1
CARNIVORA		
Canidae:		
Dingo	*Canis familiaris dingo*	3
Coyote	*Canis latrans*	1
Common jackal	*Canis aureus*	2
Timber wolf	*Canis lupus nubilus*	2
Texas red wolf	*Canis niger rufus*	1
Arctic fox	*Alopex lagopus*	2
Fennec	*Fennecus zerda*	2
Gray fox	*Urocyon cinereoargenteus*	3
Raccoon dog	*Nyctereutes procyonoides*	2
Cape hunting dog	*Lycaon pictus*	2
Big-eared fox	*Otocyon megalotis*	1

Family and common name	Scientific name	Number
Ursidae:		
Spectacled bear	*Tremarctos ornatus*	1
Himalayan bear	*Selenarctos thibetanus*	1
Japanese black bear	*Selenarctos thibetanus japonicus*	1
Korean bear	*Selenarctos thibetanus ussuricus*	2
European brown bear	*Ursus arctos*	3
Iranian brown bear	*Ursus arctos occidentalis*	2
Alaskan Peninsula bear	*Ursus gyas*	1
Grizzly bear	*Ursus horribilis*	2
Black bear	*Euarctos americanus*	1
Polar bear	*Thalarctos maritimus*	2
Hybrid bear	*Thalarctos maritimus* × *Ursus middendorffi.*	4
Malay sun bear	*Helarctos malayanus*	2
Sloth bear	*Melursus ursinus*	2
Procyonidae:		
Cacomistle, or ring-tailed cat	*Bassariscus astutus*	5
Raccoon	*Procyon lotor*	5
Raccoon (albino)	*Procyon lotor*	1
Coatimundi	*Nassua narica*	4
Peruvian coatimundi	*Nasua nasua dorsalis*	1
Kinkajou	*Potos flavus*	4
Olingo	*Bassaricyon gabbi*	2
Lesser panda	*Ailurus fulgens*	5
Mustelidae:		
Ferret	*Mustela eversmanni*	1
Marten	*Martes americana*	1
Fisher	*Martes pennanti*	1
South American tayra	*Tayra barbara barbara*	1
British Guiana tayra	*Tayra barbara poliocephala*	2
Grison	*Galictis vittata*	1
Zorilla, or striped weasel	*Ictonyx striatus*	2
Wolverine	*Gulo luscus*	1
Ratel	*Mellivora capensis*	1
American badger	*Taxidea taxus*	1
Golden-bellied ferret-badger	*Helictis moschata subaurantiaca*	3
Common skunk	*Mephitis mephitis*	2
California spotted skunk	*Spilogale putorius phenax*	1
Viverridae:		
Genet	*Genetta genetta neumannii*	7
Genet (black phase)	*Genetta genetta*	1
Formosan spotted civet	*Viverricula indica*	2
Linsang	*Prionodon linsang*	1
African palm civet	*Nandinia binotata*	2
Formosan masked civet	*Paguma larvata taivana*	1
Binturong	*Arctictis binturong*	1
African gray mongoose	*Herpestes ichneumon*	1
African water civet	*Atilax paludinosus*	4
Striped African mongoose	*Crossarchus fasciatus*	2
Black-footed mongoose	*Bdeogale* sp.	2
White-tailed mongoose	*Ichneumia albicauda*	1

Family and common name	*Scientific name*	*Number*
Hyaenidae:		
Striped hyena	*Hyaena hyaena*	2
Felidae:		
Bobcat	*Lynx rufus*	2
Lynx	*Lynx canadensis*	1
Caracal	*Lynx caracal caracal*	1
Jungle cat	*Felis chaus*	2
Pallas cat	*Felis manul*	2
Serval cat	*Felis serval*	3
Ocelot	*Felis pardalis*	1
Margay cat	*Felis wiedii*	5
Golden cat	*Felis aurata*	1
Puma	*Felis concolor*	1
Leopard	*Panthera pardus*	4
Black leopard	*Panthera pardus*	2
Lion	*Panthera leo*	6
Bengal tiger	*Panthera tigris*	2
Bengal tiger (white phase)	*Panthera tigris*	1
Jaguar	*Panthera onca*	1
Clouded leopard	*Neofelis nebulosa*	1
Snow leopard	*Uncia uncia*	2
Cheetah	*Acinonyx jubata*	2
PINNIPEDIA		
Otariidae:		
California sea-lion	*Zalophus californianus*	6
Patagonian sea-lion	*Otaria flavescens*	1
Phocidae:		
Harbor seal	*Phoca vitulina*	2
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 sp*	1
PERISSODACTYLA		
Equidae:		
Mongolian wild horse	*Equus przewalskii*	1
Burro, or donkey	*Equus asinus*	1
Grant's zebra	*Equus burchelli bochmi*	4
Grevy's zebra	*Equus grevyi*	2
Tapiridae:		
Brazilian tapir	*Tapirus terrestris*	2

Family and common name	*Scientific name*	*Number*
Rhinocerotidae:		
Great one-horned Indian rhinoceros	*Rhinoceros unicornis*	1
White, or square-lipped, rhinoceros	*Ceratotherium simum*	2
African black rhinoceros	*Diceros bicornis*	2
ARTIODACTYLA		
Tayassuidae:		
Collared peccary	*Pecari tajacu*	4
Hippopotamidae:		
Hippopotamus	*Hippopotamus amphibius*	3
Pygmy hippopotamus	*Choeropsis liberiensis*	4
Camelidae:		
Llama	*Lama glama*	6
Guanaco	*Lama glama guanicoe*	3
Alpaca	*Lama pacos*	4
Bactrian camel	*Camelus bactrianus*	1
Cervidae:		
White fallow deer	*Dama dama*	4
Axis deer	*Axis axis*	6
Red deer	*Cervus elaphus*	5
American elk	*Cervus canadensis*	1
Sika deer	*Cervus nippon*	11
Père David's deer	*Elaphurus davidianus*	1
Virginia deer	*Odocoileus virginianus*	7
Reindeer	*Rangifer tarandus*	12
Forest caribou	*Rangifer caribou*	1
Giraffidae:		
Nubian giraffe	*Giraffa camelopardalis camelopardalis.*	1
Masai giraffe	*Giraffa camelopardalis tippelskirchi.*	2
Antilocapridae:		
Pronghorn	*Antilocapra americana*	1
Bovidae:		
Sitatunga	*Tragelaphus spekii*	1
Brindled gnu, or blue wildebeest	*Connochaetes taurinus*	3
Anoa	*Anoa depressicornis*	2
Zebu	*Bos indicus*	1
Yak	*Poephagus grunniens*	3
Gaur	*Bibos gaurus*	2
Cape buffalo	*Syncerus caffer*	4
American bison	*Bison bison*	2
Dorcas gazelle	*Gazella dorcas*	5
Saiga antelope	*Saiga tatarica*	4
Himalayan tahr	*Hemitragus jemlahicus*	1
Rocky Mountain goat	*Oreamnos americanus*	1
African pygmy goat	*Capra hircus*	3
Ibex	*Capra ibex*	1
Aoudad	*Ammotragus lervia*	3
Bighorn sheep	*Ovis canadensis*	2
Dall sheep	*Ovis dalli dalli*	1

BIRDS

SPHENISCIFORMES

Family and common name	*Scientific name*	*Number*
Spheniscidae:		
King penguin	*Aptenodytes patagonica*	4
Adélie penguin	*Pygoscelis adeliae*	1

STRUTHIONIFORMES

Struthionidae:		
Ostrich	*Struthio camelus*	1

RHEIFORMES

Rheidae:		
Rhea	*Rhea americana*	1

CASUARIIFORMES

Casuariidae:		
Double-wattled cassowary	*Casuarius bicarunculatus*	2
Dromiceidae:		
Emu	*Dromiceius novachollandiae*	3

TINAMIFORMES

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 occidentalis.*	1
Dalmatian pelican	*Pelecanus crispus*	4
Sulidae:		
Gannet	*Sula bassana*	1
Phalacrocoracidae:		
Double-crested cormorant	*Phalacrocorax auritus auritus*	3
Farallon cormorant	*Phalacrocorax auritus albociliatus.*	1
European cormorant	*Phalacrocorax carbo*	6

CICONIIFORMES

Ardeidae:		
Reddish egret	*Dichromanassa rufescens rufescens.*	2
Reddish egret (white phase)	*Dichromanassa rufescens rufescens.*	1
Cattle egret	*Bubulcus ibis*	5
American egret	*Casmerodius albus*	8
Snowy egret	*Leucophoyx thula*	3
Great white heron	*Ardea occidentalis*	2

Family and common name	*Scientific name*	*Number*
Ardeidae—Continued		
Eastern green heron	*Butorides virescens*	3
Louisiana heron	*Hydranassa tricolor*	4
Black-crowned night heron	*Nycticorax nycticorax*	12
Little blue heron	*Florida caerulea caerulea*	4
American bittern	*Botaurus lentiginosus*	1
Least bittern	*Ixobrychus exilis 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*	2
European white stork	*Ciconia ciconia*	4
Indian adjutant stork	*Leptoptilos dubius*	1
White-bellied stork	*Abdimia sphenorhyncha*	2
Open-billed stork	*Anastomus oscitans*	2
Saddle-billed stork	*Ephippiorhynchus senegalensis*	1
Threskiornithidae:		
White ibis	*Eudocimus albus*	2
Scarlet ibis	*Eudocimus ruber*	8
Black-faced ibis	*Theristicus melanopis*	1
Black-headed ibis	*Threskiornis melanocephala*	1
White-faced glossy ibis	*Plegadis mexicana*	1
Eastern glossy ibis	*Plegadis falcinellus*	4
Roseate spoonbill	*Ajaia ajaja*	6
Phoenicopteridae:		
Chilean flamingo	*Phoenicopterus chilensis*	2
Cuban flamingo	*Phoenicopterus ruber*	1
Old World flamingo	*Phoenicopterus antiquorum*	1
ANSERIFORMES		
Anhimidae:		
Crested screamer	*Chauna torquata*	4
Anatidae:		
Coscoroba swan	*Coscoroba coscoroba*	4
Mute swan	*Cygnus olor*	3
Black-necked swan	*Cygnus melanocoriphus*	2
Whooper swan	*Olor cygnus*	2
Whistling swan	*Olor columbianus*	13
Trumpeter swan	*Olor buccinator*	2
Black swan	*Chenopis atrata*	9
Egyptian goose	*Alopochen aegyptiacus*	4
White-fronted goose	*Anser albifrons*	3
Indian bar-headed goose	*Anser indicus*	5
Emperor goose	*Anser canagicus*	2
Blue goose	*Anser caerulescens caerulescens*	6
Lesser snow goose (color phase)	*Anser caerulescens caerulescens*	2
Greater snow goose	*Anser caerulescens atlanticus*	5
Ross's goose	*Anser rossii*	4
Red-breasted goose	*Branta ruficollis*	4
Canada goose	*Branta canadensis*	24

Family and common name	*Scientific name*	*Number*
Anatidae—Continued		
Lesser Canada goose	*Branta canadensis leucoparcia*	5
Cackling goose	*Branta canadensis minima*	4
White-cheeked goose	*Branta canadensis occidentalis*	3
Canada goose × blue goose, hybrid	*Branta canadensis* × *Anser caerulescens.*	2
Ruddy shelduck	*Casarca ferruginea*	2
Wood duck	*Aix sponsa*	71
Mandarin duck	*Aix galericulata*	12
Indian cotton teal	*Nettapus coromandelianus*	3
Pintail duck	*Anas acuta*	5
Green-winged teal	*Anas crecca*	1
Chestnut-breasted teal	*Anas castanea*	1
Gadwall	*Anas strepera strepera*	4
European wigeon	*Anas penelope*	2
Mallard duck	*Anas platyrhynchos*	45
Mallard duck × American pintail duck, hybrid.	*Anas platyrhynchos* × *A. acuta*	1
Indian spotted-billed duck	*Anas poecilorhyncha*	1
Black duck	*Anas rubripes*	8
Greater scaup duck	*Aythya marila*	5
Lesser scaup duck	*Aythya affinis*	5
Red-headed duck	*Aythya americana*	7
Ring-necked duck	*Aythya collaris*	1
Canvasback duck	*Aythya valisineria*	5
Rosy-billed pochard	*Metopiana peposaca*	1
Red-crested pochard	*Netta rufina*	1
Bufflehead duck	*Bucephala albeola*	1
American goldeneye duck	*Bucephala clangula americana*	1
Baldpate	*Mareca americana*	10
	FALCONIFORMES	
Cathartidae:		
Andean condor	*Vultur gryphus*	1
King vulture	*Sarcoramphus papa*	1
Black vulture	*Coragyps atratus*	2
Hooded vulture	*Necrosyrtes monachus*	1
Griffon vulture	*Gyps fulvus*	1
Ruppell's vulture	*Gyps rüppellii*	3
Turkey vulture	*Cathartes aura*	8
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
Red-tailed hawk	*Buteo jamaicensis*	4
Red-shouldered hawk	*Buteo lineatus*	2
Swainson's hawk	*Buteo swainsoni*	1
Mauduyt's hawk eagle	*Spizaetus ornatus*	1
Long-crested hawk eagle	*Lophaëtus occipitalis*	1

Family and common name	*Scientific name*	*Number*
Accipitridae—Continued		
Great black hawk	*Ictinactus malayensis*	1
Golden eagle	*Aquila chrysaetos*	3
Imperial eagle	*Aquila heliaca*	2
White-breasted sea eagle	*Haliaeetus leucogaster*	1
Pallas's eagle	*Haliaeetus leucoryphus*	1
Bald eagle	*Haliaeetus leucocephalus*	2
Buzzard eagle	*Butco poecilochrous*	1
Harpy eagle	*Harpia harpyja*	1
Guianan crested eagle	*Morphnus guianensis*	1
Monkey-eating eagle	*Pithecophaga jefferyi*	1
Martial eagle	*Polemaetus bellicosus*	1
Bateleur eagle	*Terathopius ecaudatus*	2
Bearded vulture	*Gypaëtus barbatus*	1
Pandionidae:		
American osprey	*Pandion haliaetus carolinensis*	2
Falconidae:		
Sparrow hawk	*Falco sparverius*	3
Duck hawk	*Falco peregrinus anatum*	1
Feilden's falconet	*Neohierax cinereiceps*	1
Red-footed falcon, or crane hawk	*Falco vespertinus*	1
Large-billed falcon	*Falco biarmicus*	1
Forest falcon	*Micrastur semitorquatus*	2
Chimango	*Milvago chimango*	1
Chimachima hawk	*Milvago chimachima*	2
Audubon's caracara	*Polyborus cheriway*	2
White-throated caracara	*Phalcoboenus albogularis*	2
GALLIFORMES		
Megapodiidae:		
Brush turkey	*Alectura lathami*	1
Cracidae:		
Wattled curassow	*Crax globulosa*	2
Crested curassow	*Crax alector*	4
Nocturnal curassow	*Nothocrax urumutum*	1
White-headed piping guan	*Pipile cumanensis*	1
Phasianidae:		
Bobwhite, or quail	*Colinus virginianus*	1
Chuckar quail	*Alectoris graeca*	1
Gambel's quail	*Lophortyx gambeli*	2
Valley quail	*Lophortyx vallicola*	6
Argus pheasant	*Argusianus argus*	1
Golden pheasant	*Chrysolophus pictus*	3
Red junglefowl	*Gallus gallus*	6
Black-backed kaleege pheasant	*Gennaeus melanonotus*	2
Silver pheasant	*Gennaeus nycthemerus*	1
Peafowl	*Pavo cristatus*	7
Indian blue peacock	*Pavo cristatus*	1
Ring-necked pheasant	*Phasianus colchicus*	4
Ring-necked pheasant (albino)	*Phasianus colchicus*	2
Ring-necked pheasant × green pheasant, hybrid.	*Phasianus colchicus* × *P. versicolor.*	1
Bhutan, or gray peacock pheasant	*Polyplectron bicalcaratum*	2

Family and common name	*Scientific name*	*Number*
Numididae:		
Vulturine guineafowl	*Acryllium vulturinum*	3
Meleagrididae:		
Ocellated turkey	*Agriocharis ocellata*	2
Wild turkey	*Meleagris gallopavo*	1
GRUIFORMES		
Gruidae:		
Siberian crane	*Grus leucogeranus*	1
European crane	*Grus grus*	2
Sarus crane	*Antigone antigone*	2
African crowned crane	*Balearica pavonina*	5
Psophiidae:		
Trumpeter	*Psophia crepitans*	2
Rallidae:		
Cayenne wood rail	*Aramides cajanea*	2
Virginia rail	*Rallus limicola*	1
Purple gallinule	*Ionornis martinica*	2
White-breasted waterhen	*Amaurornis phoenicurus*	1
South Pacific swamp-hen	*Porphyrio poliocephalus*	1
Eurypygidae:		
Sun bittern	*Eurypyga helias*	1
Cariamidae:		
Cariama, or seriama	*Cariama cristata*	1
Otididae:		
Kori bustard	*Eupodotis kori*	2
Senegal bustard	*Eupodotis senegalensis*	1
CHARADRIIFORMES		
Jacanidae:		
Common jacana	*Jaçana spinosa*	3
Haematopodidae:		
Oystercatcher	*Haematopus ostralegus*	1
Charadriidae:		
Australian banded plover	*Zonifer tricolor*	2
European lapwing	*Vanellus vanellus*	3
South American lapwing	*Belonopterus cayennensis*	4
Crocodile bird	*Pluvianus aegyptius*	7
Recurvirostridae:		
Black-necked stilt	*Himantopus mexicanus*	1
Burhinidae:		
South American thick-knee	*Burhinus bistriatus*	1
Stercorariidae:		
MacCormick's skua	*Catharacta skua maccormicki*	1
Laridae:		
Ring-billed gull	*Larus delawarensis*	3
Kelp gull	*Larus dominicanus*	3
Laughing gull	*Larus atricilla*	3
Herring gull	*Larus argentatus*	1
Great black-backed gull	*Larus marinus*	2
Silver gull	*Larus novachollandiae*	6
Noddy tern	*Anous stolidus*	1

COLUMBIFORMES

Family and common name	*Scientific name*	*Number*
Columbidae:		
Band-tailed pigeon	*Columba fasciata*	2
High-flying Budapest pigeon	*Columba livia*	1
Black-billed pigeon	*Columba nigrirostris*	1
Triangular spotted pigeon	*Columba guinea*	2
Crowned pigeon	*Goüra victoria*	1
Blue ground dove	*Claravis pretiosa*	4
Ruddy ground dove	*Chamaepelia rufipennis*	1
Indian emerald-winged tree dove	*Chalcophaps indica*	8
Bleeding-heart dove	*Gallicolumba luzonica*	1
Diamond dove	*Geopelia cuneata*	1
Plain-breasted ground dove	*Columbigallina minuta*	8
Ground dove	*Columbigallina passerina*	2
Ring-necked dove	*Streptopelia decaocto*	5
Blue-headed ring dove	*Streptopelia tranquebarica*	2
White-winged dove	*Zenaida asiatica*	1
Mourning dove	*Zenaidura macroura*	1

PSITTACIFORMES

Psittacidae:		
Kea parrot	*Nestor notabilis*	2
Red lory	*Domicella garrula*	1
Banksian cockatoo	*Calyptorhynchus magnificus*	1
White cockatoo	*Kakatoe alba*	1
Solomon Islands cockatoo	*Kakatoe ducrops*	1
Sulphur-crested cockatoo	*Kakatoe galerita*	3
Bare-eyed cockatoo	*Kakatoe sanguinea*	3
Great red-crested cockatoo	*Kakatoe moluccensis*	1
Leadbeater's cockatoo	*Kakatoe leadbeateri*	6
Cockatiel	*Nymphicus hollandicus*	6
Yellow-and-blue macaw	*Ara ararauna*	5
Red-and-blue macaw	*Ara chloroptera*	4
Red-blue-and-yellow macaw	*Ara macao*	2
Illiger's macaw	*Ara maracana*	2
Brown-throated conure	*Conurus aeruginosus*	11
Yellow conure	*Conurus solstitialis*	1
Petz's parakeet	*Aratinga canicularis*	2
Rusty-cheeked parrot	*Aratinga pertinax*	2
Tovi parakeet	*Brotogeris jugularis*	1
Yellow-naped parrot	*Amazona auropalliata*	2
Finsch's parrot	*Amazona finschi*	1
Blue-fronted parrot	*Amazona aestiva*	5
Red-fronted parrot	*Amazona bodini*	1
Double yellow-headed parrot	*Amazona oratrix*	4
Black-headed, or Nanday, parrot	*Nandayus nanday*	7
Lineolated parakeet	*Bolborhynchus lineolatus*	2
White-winged parakeet	*Brotogeris versicolorus*	1
African gray parrot	*Psittacus erithacus*	4
Blossom-headed parakeet	*Psittacula cyanocephala*	9
Greater ring-necked parakeet	*Psittacula eupatria*	2
Rose-breasted parakeet	*Psittacula alexandri*	1
Moustached parakeet	*Psittacula fasciata*	1

Family and common name	*Scientific name*	*Number*
Psittacidae—Continued		
Lesser ring-necked parakeet	*Psittacula krameri*	4
Barraband's parakeet	*Polytelis swainsoni*	1
Quaker parakeet	*Myiopsitta monacha*	15
Grass parakeet	*Melopsittacus undulatus*	4
Rosy-faced lovebird	*Agapornis roscicollis*	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*	1
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*	1
STRIGIFORMES		
Tytonidae:		
Barn owl	*Tyto alba*	2
Strigidae:		
Great horned owl	*Bubo virginianus*	2
Screech owl	*Otus asio*	3
Spectacled owl	*Pulsatrix perspicillata*	1
Malay fishing owl	*Ketupa ketupu*	1
Snowy owl	*Nyctea nyctea*	4
Barred owl	*Strix varia varia*	9
Burrowing owl	*Speotyto cunicularia hypugaea*	2
Nepal brown wood owl	*Strix newarensis*	1
Short-eared owl	*Asio flammeus*	2
COLIIFORMES		
Coliidae:		
Mousebird	*Colius striatus*	1
TROGONIFORMES		
Trogonidae:		
Cuban trogon	*Priotelus temnurus*	1
CORACIIFORMES		
Alcedinidae:		
Kookaburra	*Dacelo gigas*	13
Coraciidae:		
Lilac-breasted roller	*Coracias caudata*	2
Indian roller	*Coracias benghalensis*	2
Bucerotidae:		
Pied hornbill	*Anthracoceros malabaricus*	1
Concave-casqued hornbill	*Buceros bicornis*	1
Abyssinian ground hornbill	*Bucorvus abyssinicus*	2

Family and common name	Scientific name	Number
Bucerotidae—Continued		
Leadbeater's hornbill	*Bucorvus leadbeateri*	1
Gray hornbill	*Tockus birostris*	1
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:		
Keel-billed toucan	*Ramphastos culminatus*	2
Sulphur-and-white-breasted toucan	*Ramphastos vitellinus*	1
Ariel toucan	*Ramphastos ariel*	4
Cuvier's toucan	*Ramphastos cuvieri*	2
Razor-billed toucanet	*Pteroglossus castanotis*	2
Picidae:		
Golden-backed woodpecker	*Brachypternus benghalensis*	2
PASSERIFORMES		
Tyrannidae:		
Kiskadee flycatcher	*Pitangus sulphuratus*	4
Acadian flycatcher	*Empidonax virescens*	2
Eastern kingbird	*Tyrannus tyrannus*	1
Pittidae:		
Indian pitta	*Pitta brachyura*	1
Alaudidae:		
Horned lark	*Eremophila alpestris*	2
Corvidae:		
Magpie	*Pica pica*	4
Yellow-billed magpie	*Pica nuttalli*	1
Asiatic tree pie	*Crypsirina formosae*	2
Magpie jay	*Calocitta formosa*	1
Blue jay	*Cyanocitta cristata*	1
European jay	*Garrulus glandarius*	2
African white-necked crow	*Corvus albus*	2
American crow	*Corvus brachyrhynchos*	3
Raven	*Corvus corax*	2
Indian crow	*Corvus splendens*	1
Formosan red-billed pie	*Cissa caerulea*	5
Occipital blue pie	*Cissa occipitalis*	1
Chinese cissa, or hunting crow	*Cissa chinensis*	3
Inca jay	*Xanthoura yncas*	1
Paridae:		
Gray tit	*Parus major*	1
Green-backed tit	*Parus monticolus*	1
Tufted titmouse	*Parus bicolor*	1
Sittidae:		
Chestnut-bellied nuthatch	*Sitta castanea*	1

Family and common name	*Scientific name*	*Number*
Timaliidae:		
Red-eyed babbler	*Chrysomma sinense*	4
Scimitar babbler	*Pomatorhinus schisticeps*	1
White-crested laughing thrush	*Garrulax bicolor*	4
Black-headed sibia	*Heterophasia capistrata*	2
Silver-eared mesia	*Mesia argentauris*	3
Pekin robin	*Leiothrix luteus*	9
Crested yuhina	*Yuhina flavicollis*	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*	5
White-eared bulbul	*Pycnonotus leucotis*	1
Mimidae:		
Mockingbird	*Mimus polyglottos*	1
Catbird	*Dumetella carolinensis*	3
Turdidae:		
Wood thrush	*Hylocichla mustelina*	20
Robin (albino)	*Turdus migratorius*	1
European song thrush	*Turdus ericetorum*	2
Blackbird	*Turdus merula*	2
Cliff chat	*Thamnolaea cinnamomeiventris*	1
White-capped redstart	*Chaimarrhornis leucocephalus*	1
Muscicapidae:		
Veriter flycatcher	*Muscicapa thalassina*	1
Bombycillidae:		
Cedar waxwing	*Bombycilla cedrorum*	2
Sturnidae:		
Rose-colored pastor	*Pastor roseus*	1
Purple starling	*Lamprocolius purpureus*	3
Burchell's long-tailed starling	*Lamprotornis caudatus*	1
Amethyst starling	*Cinnyricinclus leucogaster*	1
Tri-colored starling	*Spreo superbus*	1
Starling	*Sturnus vulgaris*	2
Jungle mynah	*Acridotheres tristis*	1
Lesser hill mynah	*Gracula religiosa indica*	3
Greater Indian hill mynah	*Gracula religiosa intermedia*	2
Nectariniidae:		
Scarlet-chested sunbird	*Chalcomitra rubescens*	1
Variable sunbird	*Cinnyris venustus raccis*	2
Scarlet-tufted malachite sunbird	*Nectarinia johnstoni*	2
Beautiful sunbird	*Nectarinia pulchella*	1
Purple sunbird	*Nectarinia asiatica*	1
Tecasse sunbird	*Nectarinia tacazze*	1
Zosteropidae:		
White-eye	*Zosterops palpebrosa*	6
Vireonidae:		
Red-eyed vireo	*Vireo olivaceus*	1
Chloropseidae:		
Blue-winged fruit-sucker	*Chloropsis hardwickei*	2

Family and common name	*Scientific name*	*Number*
Coerebidae:		
Black-headed sugarbird	*Chlorophanes spiza*	2
Purple sugarbird	*Cyanerpes cocrulea*	4
Blue, or yellow-winged, sugarbird	*Cyanerpes cyaneus*	1
Bananaquit	*Coereba flavcola*	1
Parulidae:		
Kentucky warbler	*Oporornis formosus*	1
Redstart	*Setophaga ruticilla*	1
Ovenbird	*Sciurus aurocapillus*	2
Ploceidae:		
Red-naped widowbird	*Coliuspasser laticauda*	10
Giant whydah	*Diathropura procne*	1
Baya weaver	*Ploceus baya*	3
Vitelline masked weaver	*Ploceus vitellinus*	5
Mahali weaver	*Ploccipasser mahali*	1
Red bishop weaver	*Euplectes orix*	1
White-headed nun	*Lonchura maja*	4
Indian silverbill	*Lonchura malabarica*	1
Bengalese finch	*Lonchura* sp.	6
Cut-throat weaver finch	*Amadina fasciata*	2
Lavender finch	*Estrilda cocrulescens*	2
Strawberry finch	*Estrilda amandava*	1
Red-eared waxbill	*Estrilda astrild*	1
Common waxbill	*Estrilda troglodytes*	1
Zebra finch	*Poephila castanotis*	10
Gouldian finch	*Poephila gouldiae*	1
Java sparrow	*Padda oryzivora*	13
Icteridae:		
Yellow-headed marshbird	*Xanthocephalus xanthocephalus*	1
Rice grackle	*Psomocolax oryzivora*	1
Purple grackle	*Quiscalus quiscula*	4
Swainson's grackle	*Holoquiscalus lugubris*	1
Boat-tailed grackle	*Megaquiscalus major*	1
Glossy cowbird	*Molothrus bonariensis*	2
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*	8
Thraupidae:		
Palm tanager	*Tanagra palmarum*	1
Blue tanager	*Thraupis cana*	2
White-edged tanager	*Thraupis leucoptera*	2
Yellow-rumped tanager	*Ramphocelus icteronotus*	1
Passerini's tanager	*Ramphocelus passerinii*	1
Maroon, or silver-beaked, tanager	*Ramphocelus jacapa*	3
Scarlet tanager	*Piranga olivacea*	5
Red tanager	*Piranga rubra*	1
Fringillidae:		
Tropical seed finch	*Oryzoborus angolensis*	3
Rice grosbeak	*Oryzoborus crassirostris*	1
Evening grosbeak	*Hesperiphona vespertina*	3

Family and common name	*Scientific name*	*Number*
Fringillidae—Continued		
Black-throated cardinal	*Paroaria gularis*	5
Black-eared cardinal	*Paroaria gularis nigro*	1
Cardinal	*Richmondena cardinalis*	3
European linnet	*Carduelis cannabina*	4
European goldfinch	*Carduelis carduelis*	3
European goldfinch × canary (hybrid).	*Carduelis carduelis* × *Serinus canarius.*	1
Canary	*Serinus canarius*	2
Green finch	*Chloris chloris*	1
Lesser yellow finch	*Sicalis lutcola*	2
Saffron finch	*Sicalis flavcola*	5
White-lined finch	*Spermophila lincola*	5
European bullfinch	*Pyrrhula pyrrhula*	1
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*	9
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*	5

REPTILES

LORICATA

Alligatoridae:		
Caiman	*Caiman sclerops*	3
Black caiman	*Melanosuchus niger*	8
American alligator	*Alligator mississipiensis*	16
Chinese alligator	*Alligator sinensis*	2
Crocodilidae:		
Broad-nosed crocodile	*Osteolaemus tetraspis*	2
African crocodile	*Crocodylus niloticus*	3
Narrow-nosed crocodile	*Crocodylus cataphractus*	1
Salt-water crocodile	*Crocodylus porosus*	1
American crocodile	*Crocodylus acutus*	1
Gavialidae:		
Indian gavial	*Gavialis gangeticus*	1

CHELONIA

Chelydridae:		
Snapping turtle	*Chelydra serpentina*	20
Alligator snapping turtle	*Macrochelys temminckii*	1
Kinosternidae:		
Musk turtle	*Sternotherus odoratus*	4
Mud turtle	*Kinosternon subrubrum*	5
South American mud turtle	*Kinosternon creuntatum*	1

Family and common name	*Scientific name*	*Number*
Emydidae:		
Box turtle	*Terrapene carolina*	91
Three-toed box turtle	*Terrapene carolina*	2
Ornate box turtle	*Terrapene ornata*	1
Florida box turtle	*Terrapene bauri*	5
Kura kura box turtle	*Cuora amboinensis*	2
Diamondback turtle	*Malaclemys terrapin*	4
Map turtle	*Graptemys geographica*	2
False map turtle	*Graptemys pseudogeographica*	2
Barbour's map turtle	*Graptemys barbouri*	4
Painted turtle	*Chrysemys picta*	10
Western painted turtle	*Chrysemys picta belli*	13
Cumberland turtle	*Pseudemys scripta troostii*	7
South American red-lined turtle	*Pseudemys scripta callirostris*	2
Yellow-bellied turtle	*Pseudemys scripta scripta*	15
Red-bellied turtle	*Pseudemys rubriventris*	9
Red-eared turtle	*Pseudemys scripta elegans*	34
Southern water turtle	*Pseudemys floridana*	7
Florida red-bellied turtle	*Pseudemys nelsoni*	2
Central American turtle	*Pseudemys ornata*	2
Cuban water turtle	*Pseudemys decussata*	1
Chicken turtle	*Deirochelys reticularia*	2
Spotted turtle	*Clemmys guttata*	3
Wood turtle	*Clemmys insculpta*	5
Iberian pond turtle	*Clemmys leprosa*	2
European water terrapin	*Clemmys caspica rivulata*	14
European pond turtle	*Emys orbicularis*	3
Blanding's turtle	*Emys blandingii*	2
Reeves' turtle	*Chinemys reevesii*	4
Testudinidae:		
Giant Aldabra tortoise	*Testudo elephantina*	2
Galapagos tortoise	*Testudo vicina*	2
Duncan Island tortoise	*Testudo ephippium*	2
South American tortoise	*Testudo denticulata*	5
Star tortoise	*Testudo elegans*	1
European tortoise	*Testudo graeca*	1
Mountain tortoise	*Testudo emys*	2
Texas gopher tortoise	*Gopherus berlandieri*	2
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
Murray turtle	*Emydura macquarrii*	3
South American gibba turtle	*Mesoclemmys gibba*	2
Flat-headed turtle	*Platemys platycephala*	3

Family and common name	*Scientific name*	*Number*
Trionychidae:		
Southern soft-shelled turtle	*Trionyx ferox*	4
Texas soft-shelled turtle	*Trionyx emoryi*	1
African soft-shelled turtle	*Trionyx triunguis*	2
	SAURIA	
Gekkonidae:		
Giant gecko	*Gekko stentor*	1
Tokay gecko	*Gekko gecko*	27
Day gecko	*Phelsuma cepediannm*	3
Day gecko	*Phelsuma* sp	2
Iguanidae:		
Common iguana	*Iguana iguana*	1
Carolina anole	*Anolis carolinensis*	50
Texas horned lizard	*Phrynosoma cornutum*	10
Fence lizard	*Sceloporus undulatus*	2
Texas spiny lizard	*Sceloporus olivaceus*	2
Crevice spiny lizard	*Sceloporus poinsetti*	3
Cuban spiny lizard	*Leiocephalus varius*	2
Collared lizard	*Crotaphytus collaris*	3
Spiny-tailed iguana	*Ctenosaura acanthura*	3
Ameiva lizard	*Ameiva ameiva ameiva*	6
Ameiva lizard	*Ameiva ameiva praesignis*	1
Agamid lizard	*Hoplurus saxicola*	2
Chuckwalla	*Sauromalus hispidus*	1
Scincidae:		
Mourning skink	*Egernia luctuosa*	2
White's skink	*Egernia whitei*	4
Shirt-lined skink	*Eumeces brevilineatus*	5
Greater five-lined skink	*Eumeces fasciatus*	1
Great Plains skink	*Eumeces obsoletus*	2
Broad-headed skink	*Eumeces laticeps*	1
Sand skink	*Scinus officinalis*	2
Stump-tailed skink	*Tiliqua rugosa*	1
Malayan skink	*Mabuya multifasciata*	2
Gerrhosauridae:		
African plated lizard	*Zonosaurus* sp	2
Madagascar plated lizard	*Zonosaurus madagascariensis*	3
Bronze plated lizard	*Zonosaurus aeneus*	1
Plated lizard	*Gerrhosaurus major*	1
Plated lizard	*Gerrhosaurus validus*	2
Lacertidae:		
European green lizard	*Lacerta viridis*	9
European green lizard	*Lacerta strigata trilineata*	8
Teiidae:		
Yellow tegu	*Tupinambis teguexin*	4
Race runner	*Cnemidophorus sacki gularis*	1
Teiid lizard	*Cnemidophorus* sp	3
Cordylidae:		
South African spiny lizard	*Cordylus vandami perkoensis*	2
Varanidae:		
Dumeril's monitor	*Varanus dumerili*	2
Indian monitor	*Varanus flavescens*	1

Family and common name	*Scientific name*	*Number*
Varanidae—Continued		
Malayan monitor	*Varanus salvator*	1
Philippine monitor	*Varanus nuchalis*	4
Helodermatidae:		
Gila monster	*Heloderma suspectum*	1
Mexican beaded lizard	*Heloderma horridum*	1
Beaded lizard (black phase)	*Heloderma horridum alvernensis*	1
Anguidae:		
Glass lizard	*Ophisaurus ventralis*	3
European glass lizard	*Ophisaurus apodus*	2
SERPENTES		
Boidae:		
Anaconda	*Eunectes murinus*	1
Cook's tree boa	*Boa cuydris cooki*	5
Emerald tree boa	*Boa caninus*	2
Boa constrictor	*Constrictor constrictor*	2
Emperor boa	*Constrictor imperator*	1
Cuban ground boa	*Tropidophis melanura*	1
Rainbow boa	*Epicrates cenchria*	3
Cuban tree boa	*Epicrates angulifer*	3
Sand boa	*Eryx conica*	1
Ball python	*Python regius*	2
Indian rock python	*Python molurus*	2
Regal python	*Python reticulatus*	5
Acrochordidae:		
Elephant trunk snake	*Acrochordus javanicus*	1
Colubridae:		
King snake	*Lampropeltis getulus getulus*	1
Speckled king snake	*Lampropeltis getulus holbrooki*	3
California king snake	*Lampropeltis getulus californiae*	1
Florida king snake	*Lampropeltis getulus floridana*	1
Sonoran king snake	*Lampropeltis getulus splendida*	3
Scarlet king snake	*Lampropeltis triangulum doliata*	1
Milk snake	*Lampropeltis triangulum*	1
Tropical king snake	*Lampropeltis polyzonus*	1
Garter snake	*Thamnophis sirtalis sirtalis*	2
Garter snake (melanistic phase)	*Thamnophis sirtalis sirtalis*	2
Black-necked garter snake	*Thamnophis cyrtopsis ocellata*	1
Ribbon snake	*Thamnophis sauritus*	1
Western hognose snake	*Heterodon nasicus*	1
Water snake	*Natrix sipedon*	2
Red-bellied water snake	*Natrix erythrogaster*	1
Island water snake	*Natrix insularum*	2
European grass snake	*Natrix natrix natrix*	4
European water snake	*Natrix natrix persa*	2
Brazos water snake	*Natrix harteri*	2
Water snake	*Natrix harteri paucimaculata*	2
Diamondback water snake	*Natrix rhombifera*	1
Tessellated water snake	*Natrix tessellata*	4
Tessellated water snake (green phase).	*Natrix tessellata*	2
Queen snake	*Natrix septemvittata*	1

Family and common name	*Scientific name*	*Number*
Colubridae—Continued		
Indigo snake	*Drymarchon couperi*	1
Pilot black snake	*Elaphe obsoleta obsoleta*	3
Pilot black snake (albino)	*Elaphe obsoleta obsoleta*	1
Corn snake	*Elaphe obsoleta guttata*	2
Fox snake	*Elaphe vulpina*	2
Asiatic rat snake	*Elaphe taeniura*	2
Lindheimer's rat snake	*Elaphe lindheimeri*	1
Great Plains rat snake	*Elaphe emoryi*	2
Chicken snake	*Elaphe quadrivittata*	2
Aesculapian snake	*Elaphe longissima subgrisea*	7
Formosan rat snake	*Dinodon rufozonatum*	4
Oshima rat snake	*Zaocys oshimai*	1
Cat-eyed snake	*Leptodeira annulata*	1
Black racer	*Coluber constrictor constrictor*	1
European racer	*Coluber jugularis caspius*	2
European racer (melanistic phase)	*Coluber viridiflavus*	1
Red racer	*Masticophis flagellum frenatum*	1
Western coachwhip	*Masticophis flagellum testaceus*	3
Ring-necked snake	*Diadophis punctatus edwardsii*	1
Lesser Indian rat snake	*Elaphe carinata*	9
Eastern worm snake	*Carphophis amoenus*	1
DeKay's snake	*Storeria dekayi*	1
Rough green snake	*Opheodrys aestivus*	2
Green whip snake	*Dryophis prasinus*	1
Bull snake	*Pituophis catenifer sayi*	2
Great Basin gopher snake	*Pituophis catenifer deserticola*	1
Greater Indian rat snake	*Ptyas mucosus*	4
European malpolon	*Malpolon monspessulanus*	2
File snake	*Simocephalus capensis*	1
Wolf snake	*Lycodon flavomaculatus*	1
Tantilla snake	*Tantilla gracilis*	2
Texas long-nosed snake	*Rhinocheilus lecontei tessellatus*	2
Formosan green snake	*Liopeltis major*	2
Cat-eyed snake	*Eteirodipsas* sp.	1
Green-headed tree snake	*Leptophis mexicanus*	1
Elapidae:		
Indian cobra	*Naja naja*	1
Taiwan cobra	*Naja naja atra*	12
King cobra	*Ophiophagus hannah*	2
Many-banded krait	*Bungarus multicinctus*	10
Crotalidae:		
Southern copperhead	*Ancistrodon contortrix contortrix.*	1
Northern copperhead	*Ancistrodon contortrix mokeson*	4
Western broad-banded copperhead	*Ancistrodon contortrix laticinctus*	2
Water moccasin, or cottonmouth	*Ancistrodon piscivorus*	2
Asian snorkel viper	*Ancistrodon acutus*	1
Green palm viper	*Trimeresurus gramineus*	29
Stejneger's palm viper	*Trimeresurus stejnegeri*	3
Mamushi, or Asiatic viper	*Trimeresurus elegans*	1
Habu, or Asiatic viper	*Trimeresurus flavoviridis*	1

Family and common name	*Scientific name*	*Number*
Crotalidae—Continued		
Taiwan habu	*Trimeresurus okinavensis*	4
Western diamondback rattlesnake	*Crotalus atrox*	13
Timber rattlesnake	*Crotalus horridus*	5
Canebrake rattlesnake	*Crotalus atricaudatus*	1
Viperidae:		
Gaboon viper	*Bitis gabonica*	2
European viper (melanistic phase)	*Vipera berus*	1
European viper	*Vipera ammodytes meridionalis*	1
European viper	*Vipera ammodytes montandoni*	2
European viper	*Vipera ammodytes ammodytes*	2
Russell's viper	*Vipera russellii*	2

AMPHIBIANS

CAUDATA

Amphiumidae:		
Congo eel	*Amphiuma means*	1
Ambystomidae:		
Spotted salamander	*Ambystoma maculatum*	1
Salamandridae:		
Japanese red-bellied newt	*Diemictylus pyrrhogaster*	8
Red-spotted newt	*Diemictylus viridescens*	11

SALIENTIA

Bufonidae:		
American toad	*Bufo terrestris americanus*	1
Blomberg's toad	*Bufo blombergi*	2
Giant toad	*Bufo marinus*	5
Cuban toad	*Bufo peltocephalus*	6
Pelobatidae:		
European spadefoot toad	*Pelobates fuscus*	4
Pipidae:		
Surinam toad	*Pipa pipa*	15
African clawed frog	*Xenopus laevis*	4
Congo pygmy frog	*Hymenochirus* sp.	2
Leptodactylidae:		
Colombian horned frog	*Ceratophrys calcarata*	2
Hylidae:		
Barking tree frog	*Hyla gratiosa*	3
Green tree frog	*Hyla cinerea*	1
Cuban tree frog	*Hyla septentrionalis*	3
European tree frog	*Hyla arborea*	8
Gray tree frog	*Hyla versicolor*	2
Microhylidae:		
Narrow-mouthed toad	*Microhyla carolinensis*	2
Ranidae:		
African bull frog	*Rana adspersa*	1
American bull frog	*Rana catesbeiana*	1
Green frog	*Rana clamitans melanota*	1
Leopard frog	*Rana pipiens*	25

FISHES

NEOCERATODONTOIDEI

Family and common name	*Scientific name*	*Number*
Protopteridae:		
African lungfish	*Protopterus annectens*	2

OSTARIOPHYSOIDEI

Characidae:		
Piranha	*Serrasalmus niger*	1
Metynnis	*Metynnis rooseveltii*	1
Black tetra	*Gymnocorymbus ternetzi*	1
Cyprinidae:		
Zebrafish	*Brachydanio rerio*	4
Tiger barb	*Puntius partipentazona*	2
White Cloud Mountain fish	*Tanichthys albonubes*	8
Electrophoridae:		
Electric eel	*Electrophorus electricus*	8
Gymnotidae:		
African knifefish	*Sternarchella schotti*	1

CYPRINODONTOIDEI

Poeciliidae:		
Flag-tailed guppy	*Lebistes reticulatus*	10
Guppy	*Lebistes reticulatus*	15
Black mollie	*Mollienesia latipinna*	3
Platy, or moonfish	*Xiphophorus maculatus*	2

PERCOMORPHOIDEI

Anabantidae:		
Climbing perch	*Anabas testudineus*	3
Cichlidae:		
Peacock cichlid	*Astronotus ocellatus*	1
Egyptian mouthbreeder	*Haplochromis multicolor*	3
African mouthbreeder	*Pelmatochromis belladorsalis*	2
Angelfish	*Pterophyllum cimekei*	2
Jack Dempsey fish	*Cichlasoma biocellatum*	8
Jewelfish	*Hemichromis bimaculatus*	1
Loricariidae:		
South American catfish	*Plecostomus plecostomus*	2

ARTHROPODS

DECAPODA

Cenobitidae:		
Land hermit crab	*Coenobita clypeatus*	23
Gecareinidae:		
Florida blue land crab	*Cardisoma guanhumi*	2

ARANEIDA

Theridiidae:		
Black-widow spider	*Latrodectus mactans*	1
Aviculariidae:		
Tarantula	*Eurypelma* sp.	1

ORTHOPTERA

Family and common name	*Scientific name*	*Number*
Blattidae:		
Tropical giant cockroach	*Blaberus giganteus*	30

MOLLUSKS

PULMONATA

Planorbidae:		
Pond snail	*Helisoma trivolvis*	30

REORGANIZATION

A reorganization of management of the National Zoological Park was completed during the year. The number of departments was reduced from five to three, headed by the office of the director.

The functions of the animal department, under Dr. W. T. Roth, were increased to include the veterinary and commissary divisions. This department also has reptile, bird, small mammal, and large mammal divisions. It provides for the development, identification, classification, and care of the zoological collection. The veterinary division provides medical care for the collection. The commissary division provides food for the animals. The duties of the reptile, bird, small mammal, and large mammal divisions include cleaning of enclosures, feeding and watering the animals, observing and inspecting for signs of sickness or injury, and administering prescriptions as ordered.

A scientific research department, under J. Lear Grimmer, was created, and at the present time is operating with one division, the information and education division. A research division will be formed at a later date. This department provides zoological research, educational, and informational programs and activities. The information and education division designs, creates, and maintains all signs, enclosure labels, and directional aids (with the exception of police traffic signs) and prepares for publication and distribution information about the National Zoological Park and the animal collection.

The administrative services department, under Travis E. Fauntleroy, Jr., includes the mechanical, police, grounds, and services divisions. This department provides administrative and operational services necessary for support of the functions of the National Zoological Park. The mechanical division constructs, renovates, repairs, and maintains the buildings. The police division protects the buildings, grounds, facilities, property, employees, and visitors. The grounds division provides gardening, tree care, and grounds maintenance. The service division provides operational services, including

procurement and supply, custodial and labor activities, transportation service, vehicle and motorized equipment maintenance, restrooms, telephone switchboard, and messenger service.

PERSONNEL

William R. James, captain of the National Zoological Park police since 1953, died at the age of 62 on December 21, 1961. He had been an employee of the Park since 1922 and on the police force since 1929. The quiet, efficient manner in which he handled his work won him the respect not only of his fellow employees but also of the thousands of visitors whom he befriended.

The director was one of the 10 "outstanding young men" of the year in Government service to receive the Arthur Flemming Award.

In September the director visited a number of western zoos to study new construction in connection with the forthcoming construction program at the National Zoological Park. He also attended the annual conference of the American Association of Zoological Parks and Aquariums in Rochester, N.Y., and was elected secretary of the association for 1961–62.

Two new positions were filled: Dr. Waldfried T. Roth became general curator of the National Zoological Park on August 7, 1961; Miss Marion McCrane was appointed zoologist on April 17, 1962. She has been assigned to the information and education division and is working on a project to design new labels for the entire collection.

Dr. James F. Wright, appointed veterinarian at the Zoo on August 5, 1957, resigned on June 30, 1962, to take a position in the U.S. Public Health Service. In addition to his regular duties in the Park, Dr. Wright has made a valuable contribution to the study of the projectile syringe and its use in capturing and treating wild animals.

Tony Wallace, who came to the Zoo as a mason November 27, 1933, retired May 26, 1962; and George Schmedegaard, an animal keeper since April 10, 1948, retired June 30, 1962. Samuel Beeler, animal keeper, was recalled to military service on September 30, 1961.

Thomas Schneider, animal keeper, was promoted to medical technologist.

In the fiscal year 1962 there were 205 authorized positions in the Zoo: Administrative office, 17, an increase of 1 (zoologist); animal department, 80, an increase of 4 (1 commissary steward, 2 night keepers, 1 biologist); mechanical department, 64, an increase of 3 (1 subjourneyman, 2 laborers); police department, 33; grounds department, 11.

FRIENDS OF THE NATIONAL ZOO

The Friends of the National Zoo, a group of civic-minded citizens, continued their interest in the development and expansion of the Zoo. Robert McLaughlin, former Commissioner of the District of Columbia, was elected president of the organization. Its membership has been kept informed on plans for the modernization of the Zoo, and at a luncheon on February 21 the director showed the Friends the master plan for a 10-year capital outlay program for the Zoo.

The Friends are actively backing plans for a "Breeding Zoo" in this country, to be established possibly as a cooperative venture by American zoos under the direction of the Federal Government, and John Perry, former president of the Friends, contributed an article to the Saturday Evening Post (April 7, 1962) dealing with the necessity of some sort of "Operation Rescue" for animals now threatened with extinction.

From June 1 to June 10 the Friends sponsored a "Home Show for Birds," which took place outside the birdhouse. The many types of birdhouses, feeding stations, and bird baths displayed attracted much favorable attention, not only from visitors but also from the native wild birds.

On June 6 the Friends gathered for their annual night visit of the Park, and saw many of the animals under nocturnal conditions.

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, proper diet, or treatment of disease. Visitors to the office as well as to the animal exhibits are constantly seeking information.

An innovation this year was the showing of films made of Zoo animals over the new educational TV station in Washington, Station WETV, channel 26. Five programs dealing with mammals, birds, reptiles, and amphibians were beamed to the children of Maryland, Virginia, and the District of Columbia. Lulu, the baby chimpanzee, appeared on a Science Program entitled "Space," and her keeper, Mr. Gallagher, spoke of the contributions chimpanzees have made to space travel. One of this year's lion cubs appeared on channel 4, WRC–TV, with M. Brown, keeper in charge of the lion house.

The director addressed the annual meeting of the Dallas (Tex.) Zoological Society on October 23, 1961. He also gave two radio talks and several illustrated lectures to local clubs and civic organizations, as well as a lecture on the white tiger to a Smithsonian

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Institution seminar. He assisted WMAL–TV in taping a Zoo program, which was broadcast on April 14, and advised Parthenon Pictures of Hollywood on the Zoo section of a travel film they were making of Washington, D.C.

Dr. James F. Wright gave many illustrated talks on the use of the projectile syringe in immobilizing or treating wild animals. Among the groups he addressed were the School of Veterinary Medicine, University of Pennsylvania; the Zoo Veterinary Association of the American Veterinary Medical Association, meeting in Detroit, Mich.; the Veterinary Pathology group of the Armed Forces Institute of Pathology; Biological Society of Washington; Grayson Laboratory personnel of the University of Maryland.

Sgt. Marvin Jones, U.S. Army, now stationed at Fort Myer, made a signal contribution to the history of the Zoo by reorganizing the card catalog of mammals in the collection since 1888 and publishing a mimeographed list giving the scientific name, common name, date when each species was first exhibited, date of the first birth of a species in the collection, and designating by an asterisk the animals still living in the Zoo on June 30, 1962.

Ordinarily the Zoo does not conduct guided tours of the Park, but exceptions were made for three groups of handicapped children and adults. Mrs. Perle Mesta and Miss Jane Russell sponsored the visit on June 18 of 52 children from WAIF (World Adoption International Foundation). The occasion was the adoption of the 10,000th child by American parents under this foundation.

On July 13, 1961, 1,842 foreign students from 50 different countries toured the Zoo; on May 12, 1962, the school patrol, consisting of 6,336 students from all parts of the country, came to the Park following their annual parade on Constitution Avenue.

The Virginia Herpetological Society held its annual meeting in the reptile house on August 11, 1961. The American Society of Ichthyologists and Herpetologists, holding its 42d Annual Meeting in Washington, came to the Zoo on Sunday morning, June 17, and about 100 scientists were shown the reptile house before the regular visiting hours.

REPORT OF THE VETERINARIAN

In the Annual Reports for 1960 and 1961 reference was made to the similarity, both clinically and pathologically, of a central nervous system syndrome occurring in monkeys at the Park to the "Acute Amaurotic Epilepsy" described by Langdon and Cadwallader in 1915 and Van Bogaert and Scherer in 1935. Since the last Annual Report four additional cases have been seen clinically in young monkeys, one of which was euthanized for viral isolation studies, the others being

still under observation. The euthanized individual was an 8-month-old female sooty mangabey (*Cercocebus fuliginosus*); the three monkeys under observation are two 10-month-old Barbary apes (*Macaca sylvanus*), one male and one female, and one hybrid macaque (*M. philippinensis* × *M. irus*). Tissues were also taken for viral isolation attempts from two black-crested mangabeys (*Cercocebus aterrimus*) with histories of at least one CNS seizure. One of these monkeys was apparently blind without visible defect in the eyes, and both seemed normal in all other respects.

Although no viral agents were isolated from the black-crested mangabeys mentioned above, the histopathological sections of the blind animal showed enough lesions in the optic nerve to account for its blindness. It has not been determined what was responsible for these lesions although they appear to be of long standing. No viral agent has been demonstrated in the tissues from the 8-month-old sooty mangabey described above. All viral isolation attempts included culture and intracerebral mouse and hamster inoculation.

The three remaining young macaques still under observation have been free from seizures and any other abnormal clinical signs for approximately 3 months.

The virus isolation attempts were performed by Dr. Anthony Morris, chief of the Section on Respiratory Viruses of the Laboratory of Virology and Rickettsiology, Division of Biologics Standards, National Institutes of Health.

From the past 4 years' experience with this condition, several facts became apparent. First, the condition has occurred only in Old World monkeys, the Cercopithecidae (except for one gibbon, *Hylobates* sp.). It has involved the genera *Macaca*, *Cercocebus*, *Cercopithecus*, and *Hylobates* (one case), with the genus *Macaca* most often noted. Second, there seems to be no relation to the habitat of the animal, some cases appearing in a closed exhibit building, others in all-season outdoor cages, and one case in a monkey that had been raised in a keeper's home from the day of birth. Third, the condition is first seen when the animal is usually less than a year old. Both sexes have been affected but females predominate. Fourth, those animals which have died usually did so after the first or second noted CNS seizure. Several animals which had one or two seizures in their first year have been followed until age 2½ without report of additional seizures and without apparent blindness. Fifth, in none of the cases has there been any diarrhea during or after the seizure, nor had there been any evidence of inappetence. Some animals which had been eating at the onset of the seizure began to eat again within minutes after the attack, and there was no animal noted that did not eat within the day.

In spite of the previous points, the histopathological and microbiological studies to date on these monkeys seem to support the premise that the condition is not infectious but probably toxic. At this time the possibility of lead poisoning cannot be completely ruled out.

Parasites.—Identification of parasites from the animal collection was made by the Beltsville Parasitological Laboratory of the U.S. Department of Agriculture. The nematodes, acanthocephalids, and linguatilids were identified by M. B. Chitwood; trematodes, ticks, and mites by Dr. A. McIntosh; and cestodes by W. W. Becklund.

Bacteriology.—Tuberculosis was found to be the cause of death in four animals, two bighorn sheep, a female wisent, and an aged female gaur. The infections in the bighorn sheep and the gaur were classified as the bovine type of organism by Dr. A. G. Karlson, of the Mayo Clinic, Rochester, Minn.

Dr. J. R. Wadsworth of the Department of Animal Pathology of the University of Vermont continued to assist the Zoo with his interpretation of suspected tumor tissues from the collection.

Whenever possible, hearts and large vessels of necropsy specimens are saved for Dr. Thomas Perry, of the George Washington University School of Medicine, for his study of comparative pathology of these organs.

Dr. F. R. Lucas, director of the Livestock Sanitary Laboratory, Centreville, Md., provided clinical laboratory services and microscopic tissue reports.

Dr. K. F. Meyer, of the George Williams Hooper Foundation of the University of California, assisted the Park by determining the complement fixation titers of quarantined psittacine birds to the psittacosis antigen. He also advised the Park on a feeding and treatment regimen for all quarantined birds.

Black-bear project.—At the request of the National Park Service, a field trip was made to the Great Smoky Mountains National Park in early August 1961 to instruct park personnel in the use of the Cap-Chur equipment. Each year in several of the National Parks "rogue" bears cause personal injuries to visitors and thousands of dollars in property damage. Usually the park personnel know the individual troublesome bears by sight, but the culvert trap method of removing or translocating the bear is not always successful. Furthermore, a troublesome bear once trapped and returned is most likely to be trap shy. During approximately 6 days of field work, 20 free-ranging American black bears were injected, using the Cap-Chur equipment. Five individuals were underdosed and did not react to the drug; one syringe did not inject because of mechanical difficulties; and two bears escaped from the area during the latent period of the drug and so it could not be determined whether the dose was effective. Five bears were immo-

bilized and released after measurements, one crippled bear was immobilized and euthanized, and six were immobilized, placed in the mobile culvert traps, and translocated to the extreme boundary of the park. The drug used in these immobilization procedures was succinylcholine chloride; the estimated average immobilizing dose was 0.46 mg. per pound of estimated body weight, the average latent period of the drug was 2 minutes, and the average recovery period was 15 minutes. No difficulties were encountered from overdosage, and the animals usually showed very little reaction to the injection. Almost all immobilizations were completely carried out from the main highway which runs through the park. This field work served to support earlier theories that the bear (including all species) is the ideal subject for immobilization with the drug succinylcholine chloride. The regional director, National Park Service, commented on the project: "The results and conclusions of these tests as reported indicate that the method shows promise as a practicable means of capturing dangerous or nuisance bears for relocation or other disposition."

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

Mortality, fiscal year 1962				Total mortality, past 7 years	
Cause	Reptiles	Birds	Mammals		
No autopsy for sundry reasons [1]	155	121	32	1956	618
Attrition (within 7 days after arrival)	([2])	2	21	1957	549
Intern. diseases [3]	54	66	45	1958	550
Infect. diseases [4]	2	28	4	1959	472
Parasites	7	12	------	1960	532
Injuries, accidents	1	5	12	1961	517
Euthanasia	------	1	6	----------	
Total	219	245	120	1962	584

[1] Reasons include preserving of intact specimen for Museum and research, progressed decomposition, insufficient remains in case of predators, *et al.*

[2] No figures available.

[3] Internal diseases include acute and chronic diseases of lung, liver, kidney, and heart, and intestinal ailments other than parasite involvement, as well as CNS disorders.

[4] Infectious diseases include TB, viremia, toxoplasmosis, coccidiosis, *et al.*

The only fossa (*Cryptoprocta ferox*) in the United States, as far as was known, died on January 6, 1962. This largest of the Malagasy carnivores was acquired from Ivan T. Sanderson on October 6, 1954, as a fully adult specimen and showed obvious signs of senility during his last years at the Zoo. Post-mortem findings indicated no specific disease but rather a general physical deterioration due to old age.

The horned toad (*Ceratophrys ornata*) mentioned in last year's Annual Report died on August 7, 1961. This specimen had been collected by the National Zoological Park Expedition to Argentina and was received in the Zoo June 27, 1939. It died after 22 years 1 month 11 days in captivity.

A Malay fishing owl (*Ketupa ketupu*), collected as an adult by the National Geographic Society-Smithsonian Expedition to Netherlands East Indies in 1937, died on June 24, 1962, after 24 years 8 months 26 days in the collection.

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, a bald eagle was sent to Berlin, to be presented by Attorney General Robert Kennedy to the West Berlin Zoo.

Through the cooperation of the U.S. Fish and Wildlife Service, a number of waterfowl were obtained for the Zoo. Senior keeper W. Widman made a trip to Washington, N.C., to collect a pair of swans and a number of ducks.

Special acknowledgment is due George Kirk and John Pulaski, in the office of the Dispatch Agent in New York City, and Stephen E. Lato, Dispatch Agent in San Francisco, who are frequently called upon to clear shipments of animals coming from abroad, often at great personal inconvenience—late at night, or on a weekend.

When it is necessary to quarantine animals coming into this country, they are taken to the U.S. Department of Agriculture's station in Clifton, N.J. During the past year Dr. 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.

The reptile division is frequently called upon by hospitals or police for help in identifying snakes or snake bites. This year senior keeper M. DePrato collaborated with Dr. George B. Rabb of the Chicago Zoological Society by assembling information on crocodilians to be published in book form. The division also helped the Navy take photographs of all poisonous snakes and lizards in the collection, these to appear in a field manual for Navy personnel.

Perhaps the most important project undertaken by the reptile division was in cooperation with Dr. Bert N. Ladu and Dr. Jerome J.

Kamm, National Institutes of Health, in connection with a biochemical study of snake venom. NIH was particularly interested in venom from an Asiatic pit viper and arranged for 20 specimens to be sent to the National Zoological Park and cared for in the reptile house. The habus (*Trimeresurus*) of three different species arrived on September 15, and were milked by Mr. DePrato and keeper Lee D. Schmeltz. National Institutes of Health reported: "Research workers made use of *Trimeresurus flavoviridis* venom in biochemical experiments. The venom from this species contains an agent, still unidentified, which is not found in other venoms. This agent has the ability to digest or solubilize the walls of submicroscopic particles [microsomes] of mammalian liver. Microsomes contain enzyme systems which metabolize many types of drugs, such as barbiturates, analgesics, and hypnotics, but biochemical studies on these enzyme systems have been handicapped because the microsomal particles could not be solubilized by other methods. Making this venom available to NIH biochemists will permit them to accomplish this important step and thereby learn more about how drugs are metabolized in the liver."

The National Zoological Park arranged a large-scale shipment of American mammals and birds for the new zoo of Delhi, India. The general curator of the animal department accompanied the shipment and safely delivered 2 coyotes, 2 porcupines, 2 coatimundis, 2 foxes, 1 bear, 1 paca, 1 ocelot, 2 raccoons, 2 opossums, 2 whistling swans, 3 Virginia deer, 2 bison, and 2 pumas, and during the absence of the director of the Delhi Zoo instructed the zoo personnel there in the maintenance and husbandry requirements of this collection. Arrangements for the shipment were made by the Ambassador of the United States to India, the Honorable J. Kenneth Galbraith. Fred Stark, director of the San Antonio (Tex.) Zoo, contributed the pair of bison, and Walter Stone, director of Franklin Park Zoo in Boston, Mass., supplied the porcupines, bear, paca, ocelot, and coatimundis. The Virginia deer were a contribution from the West Virginia Game Commission. The remainder of the stock came from the collection at the National Zoo.

The director of the Zoo and the general curator spent 2 days in Boston as consultants for the Franklin Park Zoo and the Middlesex Fells Zoo in Stoneham, Mass., both of which are planning new construction.

The office of forest fire prevention, U.S. Department of Agriculture, installed a new exhibit at Smokey Bear's cage consisting of a set of large photographs showing the devastation caused by forest fires and the capture of a small singed bear. In a glass case are Smokey's hat, belt, trousers, shovel, and a jug of honey. This was in answer to the complaints frequently heard from small children who had expected Smokey to be dressed as a forest ranger.

Animals that die in the Zoo are offered to the U.S. National Museum. This year 23 animals were sent to the Museum and there preserved as scientific specimens. If the Museum does not need the animals, they are sent on request to research 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.

VISITORS

Work continued on developing a new method of estimating total visitor attendance, as mentioned in last year's Annual Report. This is being done in cooperation with Albert Mindlin and Sidney Starobin, statisticians of the management office of the District of Columbia.

Number of bus groups visiting the Zoo in fiscal year 1962

Locality	Number of groups	Number in groups	Locality	Number of groups	Number in groups
Alabama	26	1, 180	Mississippi	6	246
Arkansas	1	26	New Hampshire	3	115
Connecticut	8	374	New Jersey	29	1, 102
Delaware	12	469	New York	236	7, 874
District of Columbia	204	7, 762	North Carolina	78	7, 134
Florida	83	3, 120	Ohio	51	1, 939
Georgia	90	3, 750	Pennsylvania	333	13, 261
Illinois	12	442	Rhode Island	14	585
Indiana	4	170	South Carolina	51	2, 130
Kansas	1	40	Tennessee	45	1, 807
Kentucky	6	232	Texas	1	48
Louisiana	1	32	Vermont	3	111
Maine	8	286	Virginia	844	34, 255
Maryland	1, 154	45, 880	West Virginia	86	3, 473
Massachusetts	13	438	Wisconsin	16	527
Michigan	38	1, 492			
Minnesota	2	90	Total	3, 459	140, 390

Groups from foreign countries

Brazil	1	21	Japan	1	30
Canada	1	30	Korea	1	37
Denmark	1	21	Norway	2	68
France	1	30	Foreign students	54	1, 842
Germany	1	17			
			Total	64	2, 113

About 2 p.m. each day the cars then parked in the Zoo are counted and listed according to the State or country from which they come. This is, of course, not a census of the cars coming to the Zoo but is

valuable in showing the percentage of attendance by States of people in private automobiles. Many District of Columbia, Maryland, and Virginia cars come to the Zoo to bring guests from other States. The tabulation for the fiscal year 1962 is as follows:

	Percentage		Percentage
Maryland	33.2	Massachusetts	0.8
Virginia	23.6	Connecticut	.6
District of Columbia	20.6	South Carolina	.6
Pennsylvania	4.1	California	.5
New York	2.6	Illinois	.5
North Carolina	2.0	Michigan	.5
New Jersey	1.3	Tennessee	.5
Ohio	1.3	Georgia	.4
Florida	1.1	Indiana	.4
West Virginia	1.1	Alabama	.3

The remaining 4 percent came from other States, Canada, Canal Zone, England, France, Germany, Guam, Japan, Mexico, Nova Scotia, Panama, and Puerto Rico.

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

POLICE DEPARTMENT

After the death of Capt. William R. James (see p. 166), who had been commanding officer of the police force since 1952, Lt. C. R. Brink was promoted to the rank of captain on March 4, 1962. Lt. J. R. Wolfe, who joined the department in 1946, was appointed executive officer. E. A. King and D. B. Bell were promoted from sergeant to lieutenant, and A. S. Kadlubowski and C. S. Grubbs were promoted from private to the rank of sergeant.

A notable improvement in the police department was the installation of a two-way radio hookup between the station and the police car. This new means of communication has facilitated stronger law enforcement.

The practice of using temporary men during the busy season (April to October) continues to prove a highly satisfactory arrangement. Otherwise, the ever-increasing number of special details and assignments would result, at times, in reducing the number of regular officers available for patrol duty.

The total number of visitors stopping in the police station for information of various sorts was 9,027.

The police pistol range has been improved by the erection of a 7-foot-high safety fence on all sides. A request from the chief of

domestic operations division, Office of Security, Department of State, for the use of the pistol range was granted and a weekly program has been put into operation.

Pvt. G. R. Nicoloff was assigned as a permanent rider of the mounted section, making a total of four mounted officers. This will insure having two men riding each day to give better patrolling along the creek, and a horseman assigned to patrol the bridle paths and isolated wooded areas on Sundays and holidays. The mounted color guard continues to participate in local parades.

Sgts. A. L. Canter and C. S. Grubbs received citations in March from the American Red Cross for services rendered as first-aid instructors. The total number of first-aid cases handled by police throughout the year was 1,004.

Juvenile arrests totaled 115. A special file has been set up to handle this increase in petty misbehavior acts by juveniles. Fifty-three truant children were picked up, and appropriate action was taken; and 196 lost children were returned to their parents or school groups. The police also have charge of lost and found articles; whenever these are claimed by their owners they are returned, but 26 pairs of eyeglasses and sunglasses were sent to the Society for the Prevention of Blindness, and 3 bags of clothing and miscellaneous articles, unclaimed, were turned over to the Goodwill Industries.

The police department is closely associated with the Metropolitan Police Department of the District of Columbia, the U.S. Park Police, and police departments of nearby counties of Maryland and Virginia. The department has been aided by the D.C. Chapter, American Red Cross, which has assigned personnel to the Zoo on such days as Easter Monday, School Boy Patrol Day, and other times when unusually large crowds of children are expected. The assistance given by the Red Cross in treating minor injuries (such as skinned knees and insect bites) is greatly appreciated. The District of Columbia Fire Department Ambulance and Rescue Squad responds to calls for transporting sick or injured persons to local hospitals when necessary.

An article on the activities of the National Zoological Park police appeared in "Policeman's Association News" for October 1961.

SAFETY SUBCOMMITTEE

The National Zoological Park safety subcommittee, consisting of Lt. John R. Wolfe, chairman; Dr. James F. Wright, administration office; Capt. 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, secretary, held monthly meetings to suggest, discuss, and make recommendations to the director on safety improvements.

The safety manuals for the animal, grounds, and maintenance departments are printed and in effect. The police safety manual is in press. Each employee is issued a copy of a safety manual and is responsible for carrying out the prescribed safety measures.

The safety improvements program was continued during the year with the cooperation of the District of Columbia Department of Buildings and Grounds. The hazardous unbroken flight of steps from the main bear line to the seal pool was removed and other access provided under this program. The roofs on both wings of the reptile house were replaced and roof ventilators were installed to correct the poor air circulation in the visitor area. Also included in the program was the replacement of 890 square yards of walkway pavement, 5,431 lineal feet of fencing, and handrails on all steps throughout the Park having three or more risers.

Among the miscellaneous safeguards installed during the year were a blinker stoplight at the small door to the reptile house basement; lanterns provided to the shop to mark excavations in progress; reinforcement of the guard railing outside the elephant house; new summer and winter doors for the front of the lion house; exit lights in the small mammal building, reptile house, and monkey house. New traffic signs were put up, and all traffic and crosswalk lines were repainted.

MAINTENANCE, CONSTRUCTION, AND GROUNDS

The work of the maintenance and construction department varied from picking up and disposing of the ever-increasing amount of refuse and trash to major construction necessary in maintaining the existing buildings and grounds and providing new shelters and enclosures for the animals exhibited.

The giraffe cage, both inside and out, at the elephant house, was completely rebuilt for the Masai giraffes received on September 30, 1961. Ironwork in the cage and partitions was redesigned so as to eliminate all wood, a possible source of contamination; the ground in the outside cage was removed to a depth of 6 inches and replaced; inside and outside cages were steam cleaned and sterilized prior to repainting.

Reconstruction of the main bear line, started in 1960, was continued during the summer of 1961. Two new partition walls were built, designed to conform with those built during the previous years except that pneumatically-placed concrete was used in lieu of poured-in-place concrete, with resulting savings in time, labor, and material. Five pools were repaired, the largest of which was practically rebuilt, again using sprayed or gunned rather than poured concrete. The wooden beds in all dens were replaced.

The puma house came in for its share of the maintenance program. The west half of the inside wooden dens was removed and rebuilt. Outside, concrete paving and copings were repaired or replaced.

The downstairs office rooms in the east wing of the administration building, more than 100 years old, were refurbished following the replacement of the wood floor which had yielded to the onslaught of time and termites. Asphalt tile over the new concrete, an acoustical tile ceiling, and repainted walls and woodwork were included in the project. At the request of the division of political history of the Smithsonian Institution, a window pane from one of the upstairs rooms was removed and taken to the Institution. Visitors to the house had scratched political slogans on the glass with diamonds: "Down with Hickory's enemies"; "Huzzah for Old Hickory"; "Old Hickory Forever." One was dated 1827.

The large second-floor room at the reptile house was redone and made suitable for use as an auditorium.

The rewiring of the small mammal house was completed. A new main electrical distributing panel and a separate panel for the motors operating the ventilating system and heating controls were included in the rewiring.

A welcome improvement to the Park was the development of a large picnic area south of and adjoining the restaurant.

The grounds department continued to plant and service trees. A snow fence was put up in certain areas to deter visitors from trampling on newly planted shrubbery. Logs were used to terrace banks and protect them from erosion. It was the work of this department to remove excess soil and debris after construction jobs were done. The department continued to provide perches, hollow logs, and forage for the animals.

Agencies which provided the Zoo with plants in exchange for compost included the U.S. Plant Introduction Center, the D.C. Water Department, the National Arboretum, Walter Reed Hospital, the U.S. Botanical Gardens, and the Bureau of Naval Weapons.

PLANS FOR THE FUTURE

A master plan for the development and growth of the National Zoological Park was submitted by the architectural and engineering firm of Daniel, Mann, Johnson & Mendenhall on September 11, 1961. This plan was accepted in principle by the director and by the Board of Regents of the Smithsonian Institution. It also received the endorsement of the National Capital Planning Commission and the Fine Arts Commission.

Plans and specifications for the first phase of the reconstruction are now being prepared. Work under this phase will consist of a

modernization of the existing birdhouse and the adjacent outside exhibit areas, and the construction of an east-west perimeter road which will ultimately take the automobile traffic from the center of the Park.

The director and the staff of the National Zoological Park are working with the architects and engineers in furnishing requirements and design criteria to be followed in the development of the Zoo. An experimental panel employing the use of high tensile strength wires stretched vertically with no horizontal ties so as to be almost invisible to the viewer, yet contain the exhibited birds, has been installed between two of the hawk cages. Various species of birds will be put into this experimental enclosure to determine the optimum spacing of the vertical wires.

Plans were made by the National Capital Parks for the relocation of Beach Drive from the west side of Rock Creek to the east side, tunneling under the hill where the administration building stands. Certain limited areas of land on the east side of the creek will be turned over to National Capital Parks. This will provide a 24-hour, all-weather, north-south road connecting Potomac Parkway and Rock Creek Park. It will not be within the boundary or jurisdiction of the National Zoological Park. Work will be started in the next fiscal year.

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, 1962.

SCIENTISTS, STUDENTS, AND OBSERVERS

Following is the list of 85 scientists, students, and observers who made use of the Canal Zone Biological Area facilities on the mainland and/or visited Barro Colorado Island last year and stayed for several days in order to conduct scientific research or observe the wildlife of the area. In addition, scientists of other research and technical organizations in the Canal Zone and the Republic of Panama made use of station facilities.

Name	*Principal interest*
Andrews, Michael L., Sussex, England.	Wildlife photography.
Baker, Ann, Long Island, N.Y.	Birds.
Barghoorn, Dr. and Mrs. Elso S., Harvard University.	Limnology.
Bernstein, Dr. Irwin S., Emory University.	Rhesus monkeys.
Blest, Dr. Andrew D., University College, London.	Lepidopteran behavior.
Booth, Dr. and Mrs. Ernest S., Escondido, Calif.	Wildlife photography.
Booth, Shirley, Escondido, Calif.	Wildlife photography.
Buchsbaum, Ralph University of Pittsburgh.	Wildlife photography.
Burns, Mrs. Marjorie, Escondido, Calif.	Wildlife photography.
Campbell, Mr. and Mrs. Carlton I., Smithsonian Institution.	Inspection of facilities.
Campbell, Milton, University of Illinois.	Coleoptera.
Christiansen, James, University of Utah.	Assistant to Dr. Legler.
Collett, T. S., University College, London.	Assistant to Dr. Blest.
Collier, Dr. Gerald, San Diego State College.	Jaçana behavior and ecology.
Cottam, Dr. Grant, University of Wisconsin.	Plant morphology, physiology, and behavior.

Name	*Principal interest*
Darnall, Mr. and Mrs. J. S., Dyersburg, Tenn.	Wildlife observation.
Darnall, Mrs. Ruth, Chicago, Ill.	Wildlife observation.
Deusing, Mr. and Mrs. Murl, Baileys Harbor, Wis.	Wildlife photography.
Dwyer, Dr. John., St. Louis University.	Botany.
Evans, Jeremy, Harvard University.	Insect physiology.
Florey, Dr. and Mrs. Ernst, University of Washington.	Wildlife observation.
Gazin, Dr. and Mrs. Charles L., Smithsonian Institution.	Vertebrates.
Greenwell, Francis M., Smithsonian Institution.	Assistant to Dr. Handley.
Handley, Dr. Charles O., Smithsonian Institution.	Mammals.
Hayward, Dr. and Mrs. C. Lynn, Brigham Young University.	Wildlife observation.
Heatwole, Dr. Harold, University of Puerto Rico.	Assistant to Dr. Sexton.
Hartshorne, Mr. and Mrs. Charles, Atlanta, Ga.	Bird vocal patterns.
Hodge, Dr. Walter H., National Science Foundation.	Inspection of facilities.
Holgerson, Dr. Holger, Stavanger, Norway.	Insects and littoral marine organisms.
Hughes-Schrader, Dr. Sally, Duke University.	Cytology and cytotaxonomy of Mantispidae and Pentatomidae.
Hunt, George, Harvard University.	Flycatcher behavior and ecology.
Izower, Jack, New York, N.Y.	Tanagers and finches.
Jackson, Mr. and Mrs. B. L., Washington, D.C.	Wildlife observation.
Jones, Dr. Duvall A., Madison College.	Birds and amphibians.
Kamstedt, Brit I. S., Stavanger, Norway.	Assistant to Dr. Holgerson.
Keck, Dr. David D., National Science Foundation.	Inspection of facilities.
Knight, Dennis, University of Wisconsin.	Plant morphology, physiology, and behavior.
Legler, Dr. John M., University of Utah.	Turtles and entomology.
Livingston, Dr. Luzern G., Swarthmore College.	Diatoms.
Loftin, Horace, Florida State University.	Fresh-water fishes.
Olding, Mr. and Mrs. D., Mannings School, Jamaica, B.W.I.	Wildlife observation.

Name	*Principal interest*
O'Neill, John P., Norman, Okla.	Wildlife observation.
Owen, Mr. and Mrs. Herbert, Bremerton, Wash.	Wildlife observation.
Peebles, Dr. James S. University of Utah.	Assistant to Dr. Legler.
Pipkin, Mrs. Sarah B. Gorgas Memorial Laboratory.	Fruit flies.
Pope, Dr. and Mrs. W. Gorgas Hospital, Ancon, C.Z.	Wildlife observation.
Proctor, Vernon W. Texas Technological College.	Algae.
Ream, Dr. and Mrs. Robert, University of Wisconsin.	Plant morphology, physiology, and behavior.
Rubinoff, Dr. and Mrs. Ira, Harvard University.	Ichthyology.
Ruckes, Dr. and Mrs. Herbert, American Museum of Natural History.	Hemiptera.
Rudd, Dr. Velva, Smithsonian Institution.	Botany.
Schmitt, Mr. and Mrs. Rupert, Manitowish Water, Wis.	Wildlife observation.
Schorach, Mr. and Mrs. Carl B. Ventura, Calif.	Wildlife observation.
Sexton, Dr. Owen J., Washington University.	Amphibians and reptiles.
Smith, Dr. W. John, Harvard University.	Flycatcher behavior.
Stuart, Dr. Alastair M., University of Chicago.	Termites.
Stull, Dr. Arthur, Washington, D.C.	Wildlife observation.
Taylor, Mr. and Mrs. R. W. Harvard University.	Ants.
Tyson, Edwin L. Florida State University.	Bats.
Waldes, Mrs. Rosaline, Long Island, N.Y.	Bird observation.
Walker, John, Encyclopaedia Britannica, New York, N.Y.	Wildlife photography.
Watson, H., Canal Zone.	Wildlife observation.
Wetmore, Dr. and Mrs. Alexander, Smithsonian Institution.	Bird observation.
Willis, Edwin L., University of California.	Ecology and behavior of birds that follow army ants.
Yerger, Dr. Ralph W., Florida State University.	Fishes and mammals.

VISITORS

Approximately 190 visitors were permitted to visit the island for a day.

RAINFALL

During the dry season (January through April) of the calendar year 1961, rains of 0.01 inch or more fell during 38 days (97 hours) and amounted to 7.63 inches, as compared to 26.64 inches during 1960. During the wet season of 1961 (May through December), rains of 0.01 inch or more fell on 192 days (752 hours) and amounted to 92.58 inches, as compared to 113.43 inches during 1960. Total rain for the year was 100.21 inches. During 37 years of record, the wettest year was 1935 with 143.42 inches, and the driest was 1930 with only 76.57 inches. February was the driest month of 1961 (0.24 inch) and August the wettest (19.73 inches). The maximum records for short period 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	.....	1944	111. 96	109. 30
1926	118. 22	113. 56	1945	120. 42	109. 84
1927	116. 36	114. 68	1946	87. 38	108. 81
1928	101. 52	111. 35	1947	77. 92	107. 49
1929	87. 84	106. 56	1948	83. 16	106. 43
1930	76. 57	101. 51	1949	114. 86	106. 76
1931	123. 30	104. 69	1950	114. 51	107. 07
1932	113. 52	105. 76	1951	112. 72	107. 28
1933	101. 73	105. 32	1952	97. 68	106. 94
1934	122. 42	107. 04	1953	104. 97	106. 87
1935	143. 42	110. 35	1954	105. 68	106. 82
1936	93. 88	108. 98	1955	114. 42	107. 09
1937	124. 13	110. 12	1956	114. 05	107. 30
1938	117. 09	110. 62	1957	97. 97	106. 98
1939	115. 47	110. 94	1958	100. 20	106. 70
1940	86. 51	109. 43	1959	94. 88	106. 48
1941	91. 82	108. 41	1960	140. 07	107. 41
1942	111. 10	108. 55	1961	100. 21	106. 95
1943	120. 29	109. 20			

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TABLE 2.—*Comparison of 1960 and 1961 rainfall, Barro Colorado Island (inches)*

Month	Total		Station average	Years of record	1961 excess or deficiency	Accumulated excess or deficiency
	1960	1961				
January	2.96	1.23	2.15	36	−0.92	
February	.95	.24	1.33	36	−1.09	−2.01
March	4.47	.71	1.24	36	−0.53	−2.54
April	18.26	5.45	3.45	37	+2.00	−0.54
May	15.55	7.86	10.90	37	−3.04	−3.58
June	11.53	10.70	10.84	37	−0.14	−3.72
July	11.46	6.94	11.23	37	−4.29	−8.01
August	7.02	19.73	12.42	37	+7.31	−0.70
September	9.49	13.33	10.26	37	+3.07	+2.37
October	19.50	17.22	14.14	37	+3.08	+5.45
November	16.53	10.84	17.96	37	−7.12	−1.67
December	22.35	5.96	11.03	37	−5.07	−6.74
Year	140.07	100.21	106.95			−6.74
Dry season	26.64	7.63	8.17			−0.54
Wet season	113.43	92.58	98.78			−6.20

BUILDINGS, EQUIPMENT, AND IMPROVEMENTS

The facilities on Barro Colorado Island were improved and expanded in various ways. A partition was added to the Chapman House to improve storage and floor distribution. The Zinc Meta-Arsenate House was repaired, and portions of its electrical wiring system were replaced. New cages were constructed. The old wooden water tank was repaired and provided with a new roof. Three bridges in the forest were completely rebuilt and new poacher-warning signs were placed around the perimeter of the island. A line for a "walkie-talkie" phone was installed between the dock area and the main building to provide faster communication between these two points.

Maintenance and repair activities included complete overhauls of two generators and extensive repairs to a third. The launch and the two speedboats were painted, and the hull of the former was repaired extensively. All inboard and outboard motors were given complete service checks and outworn parts were replaced. All the buildings on the island were repainted and some wire screening was replaced. Minor repairs and improvements were made to appliances and other pieces of equipment.

The 1951 sedan and the Jeep were replaced, respectively, by a 1962 station wagon and a 1962 Jeep. A 27-foot launch was transferred

to the Canal Zone Biological Area for cargo and passenger use. The Hydrographic Office of the Panama Canal Company completed the installation of new rain-recording equipment. Expansion of the library continued.

OTHER ACTIVITIES

Two scientific aides were employed to serve as temporary assistants. Edwin L. Tyson of Florida State University is analyzing the bat population of the island and Robert M. King has begun a cytotaxonomic study of Compositae in the Canal Zone and adjacent areas.

The research of the resident naturalist continued to progress with the publication of several papers which dealt with various aspects of neotropical birds.

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 gratefully acknowledged from C. M. Goethe and Rodrigo Marciacq.

PLANS AND REQUIREMENTS

It is hoped that funds will be made available for the installation of an electric cable from the mainland to the island in order to increase the amount of electric power available and avoid dependence on the generators.

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 on the activities of the International Exchange Service for the fiscal year ended June 30, 1962:

In 1848 the Smithsonian Institution issued the first of its long series of scientific publications. In addition to the American distribution, several hundred copies were sent to scientific and other learned institutions abroad; in return, many valuable publications were received from the foreign institutions. To continue this desirable international exchange of scientific information, the Smithsonian Institution appointed agents in a number of foreign countries to facilitate exchanges. In 1851, the privilege of utilizing the Smithsonian exchange system was offered to other learned bodies, and this opportunity for wide distribution of scientific publications was so eagerly grasped that the system grew rapidly. Thus began a Smithsonian service that increased steadily in usefulness, and the quantity of material has increased from a few hundred pounds of publications transmitted in 1849, to more than 900,000 pounds in the fiscal year 1962.

From the beginning, U.S. Government departments made use of the service for the exchange of their publications for the publications of other governments. In 1886 in Brussels, a formal agreement for the exchange between countries, not only of governmental documents but also of scientific and literary publications, was ratified by eight nations. With the ratification of this Convention by the United States, the Smithsonian Institution system of exchange of publications was given official sanction and the Smithsonian Institution continued to carry on this important work and was recognized as the official agency of the United States for the international exchange of publications.

The work of the International Exchange Service serves as a means of developing and executing, in part, the broad and comprehensive objective of the Smithsonian Institution, "the diffusion of knowledge." Over the years the operations of the Service have affected most beneficially the libraries of all learned institutions in the United States and have helped to promote the rapid growth of science through facilitating the international exchange of ideas. Libraries through-

out the world have been enriched by the publications received through the Service from many institutions in the United States, and in turn the libraries of the United States have benefited from the publications received from the institutions in foreign countries.

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

Publications weighing 798,009 pounds were received by the International Exchange Service during the year from approximately 250 domestic sources for transmission to recipients in over 100 foreign countries. Publications weighing 114,509 pounds were received from foreign countries for distribution to addressees in the United States.

The Service transmitted by ocean freight addressed packages of publications, weighing 611,853 pounds to the foreign exchange bureaus, for distribution in their countries. The cost to the Smithsonian Institution for transmitting these publications was $36,717.49, or approximately 6 cents per pound. Listed below are the names of the foreign exchange bureaus to whom the International Exchange Service forwards addressed packages of publications for distribution.

LIST OF EXCHANGE SERVICES

AUSTRIA: Austrian National Library, Vienna.

BELGIUM: Service des Échanges Internationaux, Bibliothèque Royale de Belgique, Bruxelles.

CHINA: National Central Library, Taipei, Taiwan.

CZECHOSLOVAKIA: Bureau of International Exchanges, University Library, Prague.

DENMARK: Institut Danois des Échanges Internationaux, Bibliothèque Royale, Copenhagen.

EGYPT: Government Press, Publications Office, Bulaq, Cairo.

FINLAND: Library of the Scientific Societies, Helsinki.

FRANCE: Service des Échanges Internationaux, Bibliothèque Nationale, Paris.

GERMANY (Eastern): Deutsche Staatsbibliothek, Berlin.
GERMANY (Western): Deutsche Forschungsgemeinschaft, Bad Godesberg.
HUNGARY: Service Hongrois des Échanges Internationaux, Országos Széchenyi Konyvtár, Budapest.
INDIA: Government Printing and Stationery Office, Bombay.
INDONESIA: Minister of Education, Djakarta,
ISRAEL: Jewish National and University Library, Jerusalem.
ITALY: Ufficio degli Scambi Internazionali, Ministero della Pubblica Istruzione, Rome.
JAPAN: Division for Interlibrary Services, National Diet Library, Tokyo.
KOREA: Korean Library Association, Seoul.
NETHERLANDS: International Exchange Bureau of the Netherlands, Royal Library, The Hague.
NEW SOUTH WALES: Public Library of New South Wales, Sydney.
NEW ZEALAND: General Assembly Library, Wellington.
NORWAY: Service Norvégien des Échanges Internationaux, Bibliothèque de l'Université Royale, Oslo.
PHILIPPINES: Bureau of Public Libraries, Department of Education, Manila.
POLAND: Service Polonais des Échanges Internationaux, Bibliothèque Nationale, Warsaw.
PORTUGAL: Secção de Trocas Internacionais, Biblioteca Nacional, Lisbon.
QUEENSLAND: Bureau of International Exchange of Publications, Chief Secretary's Office, Brisbane.
RUMANIA: International Exchange Service, Biblioteca Centrala de Stat, Bucharest.
SOUTH AUSTRALIA: South Australian Government Exchanges Bureau, Government Printing and Stationery Office, Adelaide.
SPAIN: Junta de Intercambio y Adquisición de Libros y Revistas para Bibliotecas Públicas, Ministerio de Educación Nacional, Madrid.
SWEDEN: Kungliga Biblioteket, Stockholm.
SWITZERLAND: Service Suisse des Échanges Internationaux, Bibliothèque Centrale Fédérale, Berne.
TASMANIA: Secretary of the Premier, Hobart.
TURKEY: National Library, Ankara.
UNION OF SOUTH AFRICA: Government Printing and Stationery Office, Cape Town.
UNION OF SOVIET SOCIALIST REPUBLICS: Bureau of Book Exchange, State Lenin Library, Moscow.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: State Library, Perth.
YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.

Many countries do not have exchange facilities for the distribution of addressed publications. During the past fiscal year the International Exchange Service mailed addressed packages of publications weighing 225,335 pounds directly to the intended recipients in such countries.

There has been a noticeable increase in requests for permission to transmit publications through the International Exchange Service to the newly created nations of the world. More dental and medical libraries in the United States are finding the Service helpful in distributing their journals and books to foreign libraries.

FOREIGN DEPOSITORIES OF GOVERNMENTAL DOCUMENTS

In accordance with treaty stipulations, conventions, and other agreements made between the United States and various foreign countries for the mutual exchange of official publications, the Smithsonian Institution transmits the official U.S. Government publications to the foreign depository libraries. The libraries that receive copies of all these official publications are the full depositories of the Government documents. The libraries that receive a selected list are the partial depositories of the Government documents. During the fiscal year 662,274 pieces weighing 227,169 pounds were received by the Smithsonian Institution for transmission to the 57 full depositories, and 101,171 pieces weighing 48,764 pounds were received for transmission to the 45 partial depositories. Listed below are the names of the full and partial depositories.

FULL DEPOSITORIES

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.
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 Organismos Internacionales, Ministerio de Relaciones Exteriores, Habana.[1]
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.

See footnotes on p. 194.

GREAT BRITAIN:
ENGLAND: British Museum, London.
LONDON: London School of Economics and Political Science. (Depository of the London County Council.)
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.
ITALY: Ministero della Pubblica Istruzione, Rome.
JAPAN: National Diet Library, Tokyo.[2]
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.
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]

PARTIAL DEPOSITORIES

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.

See footnotes on p. 194.

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.
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.
VIETNAM: Direction des Archives et Bibliotheques Nationales, Saigon.[3]

INTERPARLIAMENTARY EXCHANGE OF THE OFFICIAL JOURNALS

There are now being sent abroad through the International Exchange Service 85 copies of the daily issues of the Federal Register and 100 copies of the daily issues of the Congressional Record. The names and addresses of the recipients of the official journals are listed below:

DEPOSITORIES OF CONGRESSIONAL RECORD AND FEDERAL REGISTER

ARGENTINA:
Biblioteca del Poder Judicial, Mendoza.[5]
Dirección General del Boletin Oficial e Imprentas, Buenos Aires.[1]
Cámara de Diputados Oficina de Información Parliamentaria, Buenos Aires.

See footnotes on p. 194.

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]
BRAZIL:
Biblioteca da Câmara dos Deputados, Brasilia, D.F.[4]
Secretaria da Presidencia, Rio de Janeiro.[4]
BRITISH HONDURAS: Colonial Secretary, Belize.
CAMBODIA: Ministry of Information, Phnom Penh.
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]
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]
GHANA: Chief Secretary's Office, Accra.[3 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 7]
Printed Library of the Foreign Office, London.[4]
Royal Institute of International Affairs, London.[4]
GREECE: Bibliothèque Chambre des Députés, Hellénique, Athens.
GUATEMALA: Biblioteca de la Asamblea Legislativa, Guatemala.
HAITI: Bibliothèque Nationale, Port-au-Prince.
HONDURAS: Biblioteca del Congreso Nacional, Tegucigalpa.

See footnotes on p. 194.

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.
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 Información, 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 Gutiérrez.
CHIHUAHUA: Gobernador del Estado de Chihuahua, Chihuahua.
COAHUILA: Periódico Oficial del Estado de Coahuila, Palacio de Gobierno, Saltillo.
COLIMA: Gobernador del Estado de Colima, Colima.
GUANAJUATO: Secretaría General de Gobierno del Estado, Guanajuato.[5]
JALISCO: Biblioteca del Estado, Guadalajara.
MÉXICO: Gaceta del Gobierno, Toluca.
MICHOACÁN: Secretaría General de Gobierno del Estado de Michoacán, Morelia.
MORELOS: Palacio de Gobierno, Cuernavaca.
NAYARIT: Gobernador de Nayarit, Tepic.
NUEVO LEÓN: Biblioteca del Estado, Monterrey.
OAXACA: Periódico Oficial, Palacio de Gobierno, Oaxaca.[5]
PUEBLA: Secretaría General de Gobierno, Puebla.
QUERÉTARO: Secretaría General de Gobierno, Sección de Archivo, Querétaro.
SINALOA: Gobernador del Estado de Sinaloa, Culiacán.
SONORA: Gobernador del Estado de Sonora, Hermosillo.
TAMAULIPAS: Secretaría General de Gobierno, Victoria.
VERACRUZ: Gobernador del Estado de Veracruz, Departamento de Gobernación y Justicia, Jalapa.
YUCATÁN: Gobernador del Estado de Yucatán, Mérida.

See footnotes on p. 194.

NETHERLANDS: Koninklijke Bibliotheek, The Hague.[3]
NEW ZEALAND: General Assembly Library, Wellington.
NORWAY: Library of the Norwegian Parliament, Olso.
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.[3]
RUMANIA: Biblioteca Centrala de Stat RPR, Bucharest.
SPAIN: Boletin Oficial del Estado, Presidencia del Gobierno, Madrid.[5]
SWEDEN: Universitetsbiblioteket, Uppsala.[3 4]
SWITZERLAND:
International Labour Office, Geneva.[3 7]
Library, United Nations, Geneva.
TOGO: Ministère d'État, de l'Interieur, de l'Information et de la Presse, Lome.
UNION OF SOUTH AFRICA:
CAPE OF GOOD HOPE: Library of Parliament, Cape Town.
TRANSVAAL: State Library, Pretoria.
UNION OF SOVIET SOCIALIST REPUBLICS: Fundamental'niia Biblioteka Obshchestvennykh Nauk, Moscow.
URUGUAY: Diario Oficial, Calle Florida 1178, Montevideo.
YUGOSLAVIA: Bibliografski Institut FNRJ, Belgrade.[7]

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

The number and weight of the packages received from sources in the United States for transmission abroad, and the number and weight of packages received from foreign sources intended for domestic addressees, are classified in the accompanying table. The balance of exchange is not even because many countries do not have an exchange service through which they may transmit publications to the Smithsonian Institution for distribution in the United States, therefore sending their publications directly to the addressees in the United States.

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[2] Change of address.
[2] Receives two sets.
[3] Added during the year.
[4] Congressional Record only.
[5] Federal Register only.
[6] Three copies.
[7] Two copies.

Classification	Received by the Smithsonian Institution for transmission			
	For transmission abroad		For distribution in the United States	
	Number of packages	Weight in pounds	Number of packages	Weight in pounds
U.S. parliamentary documents received for transmission abroad	816, 044	352, 959		
Publications received from foreign sources for U.S. parlimentary addressees			8, 410	11, 623
U.S. departmental documents received for transmission abroad	232, 405	225, 667		
Publications received from foreign sources for U.S. departmental addressees			5, 539	13, 719
Miscellaneous scientific and literary publications received for transmission abroad	183, 915	219, 383		
Miscellaneous scientific and literary publications received from abroad for distribution in the United States			56, 961	89, 167
Total	1, 232, 364	798, 009	70, 910	114, 509
Grand total	1, 303, 274			912, 518

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 25th annual report of the National Gallery of Art, for the fiscal year ended June 30, 1962. This report is made pursuant to the provisions of section 5(d) of Public Resolution No. 14, 75th Congress, 1st session, approved March 24, 1937 (50 Stat. 51).

ORGANIZATION

The statutory members of the Board of Trustees of the National Gallery of Art are the Chief Justice of the United States, the Secretary of State, the Secretary of the Treasury, and the Secretary of the Smithsonian Institution, ex officio. The four general trustees continuing in office during the fiscal year ended June 30, 1962, were Chester Dale, Paul Mellon, Rush H. Kress, and John Hay Whitney. Ferdinand Lammot Belin, who had been a general trustee since 1938 and vice president since 1939, died on July 6, 1961. On May 28, 1962, John N. Irwin II was elected a general trustee for the remainder of the term expiring July 1, 1971. On May 29, 1962, Chester Dale was reelected by the Board of Trustees to serve as president of the Gallery and Paul Mellon was reelected vice president.

The executive officers of the Gallery as of June 30, 1962, 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 29, 1962, 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

Chester Dale, Chairman.
Paul Mellon.
John Hay Whitney.
John Walker.

PERSONNEL

At the close of the fiscal year 1962, full-time Government employees on the staff of the National Gallery of Art numbered 307. The U.S. Civil Service regulations govern the appointment of employees paid from appropriated public funds.

Continued emphasis was given to the training of employees under the Government Employees Training Act. Under the provisions of this act, 13 Gallery employees obtained additional training in their professions.

APPROPRIATIONS

For the fiscal year ended June 30, 1962, the Congress of the United States in the regular annual appropriation for the National Gallery of Art provided $1,932,000 to be used for salaries and expenses in the operation and upkeep 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).

The following expenditures and encumbrances were incurred:

Personnel compensation and benefits	$1,689,450.15
All other items	242,473.32
Unobligated balance	76.53
Total	1,932,000.00

ATTENDANCE

There were 1,332,506 visitors to the Gallery during the fiscal year 1962, an increase of 300,166 over the previous year. The daily average number of visitors was 3,671.

ACCESSIONS

There were 1,437 accessions by the National Gallery of Art as gifts, loans, or deposits during the fiscal year.

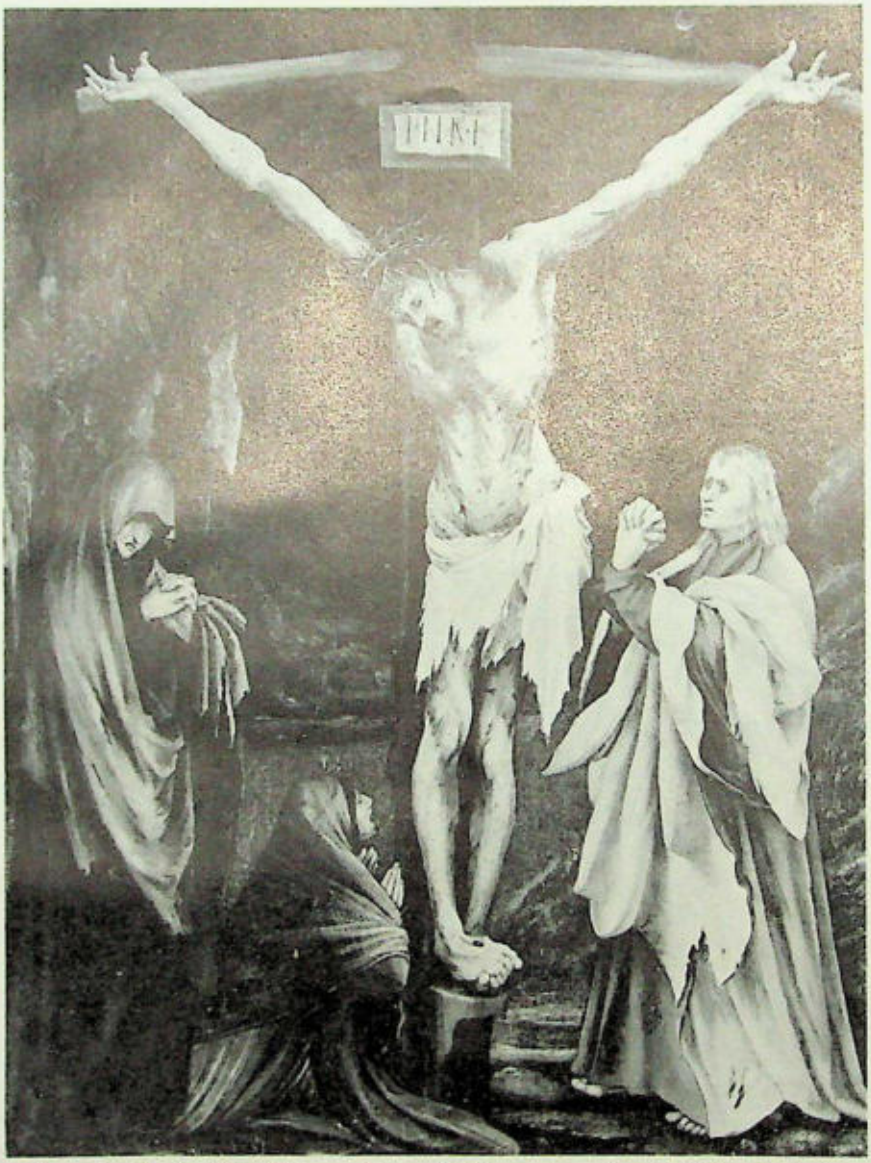
GIFTS

During the year the following gifts or bequests were accepted by the Board of Trustees:

PAINTINGS

Donor	*Artist*	*Title*
Avalon Foundation, New York, N.Y.	Sargent	A Street in Venice.
Mrs. Mellon Bruce, New York, N.Y.	Fragonard	A Young Girl Reading.

Donor	*Artist*	*Title*
Samuel H. Kress Foundation, New York, N.Y.	Aspertini	St. Sebastian.
Do	Daddi	The Crucifixion.
Do	Domenico di Bartolo.	Madonna and Child Enthroned with St. Peter and St. Paul.
Do	Bartolo di Fredi	The Presentation of the Virgin.
Do	Bellini	The Infant Bacchus.
Do	Creti	The Quarrel.
Do	Bronzino	Eleanora di Toledo.
Do	Carpaccio	Madonna and Child.
Do	Carracci	Venus Adorned by the Graces.
Do	Christus	A Donor and His Wife.
Do	Cima da Conegliano	St. Helena.
Do	Clouet	"Diane de Poitiers."
Do	David	Madame David.
Do	----do	Napoleon in His Study.
Do	Fragonard	Blindman's Buff.
Do	----do	The Swing.
Do	----do	Hubert Robert.
Do	Grünewald	The Small Crucifixion.
Do	Guercino	Cardinal Francesco Cennini.
Do	Holbein, the Younger.	Portrait of a Young Man.
Do	Juan de Flandes	The Annunciation.
Do	----do	The Nativity.
Do	----do	The Adoration of the Magi.
Do	----do	The Baptism of Christ.
Do	Largillière	A Young Man with His Tutor.
Do	Lucas van Leyden	The Card Players.
Do	Memling	The Presentation in the Temple.
Do	Master of St. Veronica	The Crucifixion.
Do	Nattier	Joseph Bonnier de la Mosson.
Do	Pierino del Vaga	The Nativity.
Do	Rubens	The Assumption of the Virgin.
Do	Saenredam	Cathedral of St. John at 's-Hertogenbosch.
Do	----do	Church of Santa Maria della Febbre, Rome.
Do	Savoldo	Elijah Fed by the Raven.
Do	Scorel	The Rest on the Flight into Egypt.
Do	Sebastiano del Piombo.	Cardinal Bandinello Sauli, His Secretary and Two Geographers.
Do	----do	Portrait of a Humanist.



Grünewald: The Small Crucifixion. National Gallery of Art. Samuel H. Kress Collection.

Tintoretto: Doge Alvise Mocenigo and Family before the Madonna and Child. National Gallery of Art. Samuel H. Kress Collection.

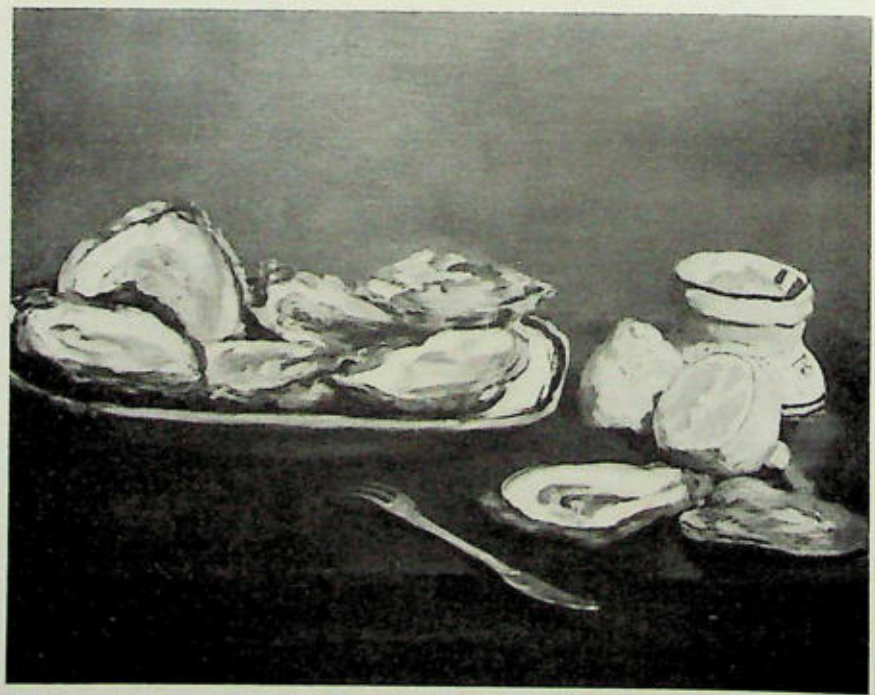
1. Bernini: Monsignor Francesco Barberini. National Gallery of Art. Samuel H. Kress Collection.

2. Titian: Doge Andrea Gritti. National Gallery of Art. Samuel H. Kress Collection.

David: Napoleon in His Study. National Gallery of Art. Samuel H. Kress Collection.

Fragonard: A Young Girl Reading. National Gallery of Art. Gift of Mrs. Mellon Bruce in memory of her father, Andrew W. Mellon.

1. Redon: Wildflowers. National Gallery of Art. Gift of Loula D. Lasker.



2. Manet: Oysters. National Gallery of Art. Gift of the Adele R. Levy Fund, Inc.

Donor	Artist	Title
Samuel H. Kress Foundation, New York, N.Y.	Signorelli	The Marriage of the Virgin.
Do	Solario	Pietà.
Do	Strozzi	Bishop Alvise Grimani.
Do	Tiepolo	A Scene from Roman History.
Do	Tintoretto	The Conversion of St. Paul.
Do	----do	Doge Alvise Mocenigo and Family before the Madonna and Child.
Do	Titian	Doge Andrea Gritti.
Do	Valdés Leal	The Assumption of the Virgin.
Do	Veronese	St. Jerome in the Wilderness.
Do	-----do	St. Lucy and a Donor.
Do	Ghirlandaio	Madonna and Child.
Do	Watteau	Ceres (Summer).
Do	Zoppo	Madonna and Child.
Do	Vouet	St. Jerome and the Angel.
Do	Canaletto	The Portello and the Brenta Canal at Padua.
Do	French Master, second half, 15th century.	Portrait of an Ecclesiastic.
Do	French School, 1572	Prince Hercule-François, Duc d'Alencon.
Do	Luini	The Magdalen.
Do	Florentine School, 16th century.	Dante.
Do	Ricci, Sebastiano and Marco.	Memorial to Admiral Sir Clowdisley Shovell.
Do	Rosso, Il	Portrait of a Man.
Do	Rubens	Marchesa Brigida Spinola Doria.
Do	Vouet	The Muses Urania and Calliope.
Do	Baldung Grien	St. Anne with the Christ Child, the Virgin, and St. John the Baptist.
Do	Bellotto	The Castle of Nymphenburg.
Do	----do	View of Munich.
Do	Bourdon	The Finding of Moses.
Do	Bouts	Portrait of a Donor.
Do	Bramantino	The Apparition of Christ among the Apostles.
Do	Correggio	Salvator Mundi.
Do	Cranach, the Elder	The Crucifixion with Longinus.

Donor	*Artist*	*Title*
Samuel H. Kress Foundation, New York, N.Y.	Diana	The Presentation and Marriage of the Virgin, Annunciation.
Do	Fei	The Assumption of the Virgin.
Do	Foppa	St. Bernardino.
Do	Gentileschi	St. Cecilia and an Angel.
Do	Goya y Lucientes	Don Antonio Noriega.
Do	Hamen y León	Still Life.
Do	La Tour	Claude Dupouch.
Do	Master of Badia a Isola.	Madonna Enthroned with Angels.
Do	Master of the St. Bartholomew Altar.	The Baptism of Christ.
Do	Mor	Portrait of a Young Man.
Do	Nicolò dell' Abate and Denys Calvaert.	The Judgment of Paris.
Do	Patinir, follower of	The Flight into Egypt.
Do	Piazzetta	Madonna and Child Appearing to San Filippo Neri.
Do	Pontormo	Monsignor della Casa.
Do	Prud'hon	David Johnston.
Do	Ruisdael	Landscape.
Do	Savoldo	The Adoration of the Child.
Do	Signorelli	Madonna and Child with Saints.
Do	Strigel	St. Mary Cleophas and Her Family.
Do	----do	St. Mary Salome and Her Family.
Do	Tintoretto	Summer.
Do	Vassallo	The Larder.
Do	Venetian Master, third quarter, 18th century.	Before the Masked Ball.
Do	Seyffert	Rush H. Kress.
Miss Loula D. Lasker, New York, N.Y.	Redon	Wildflowers.
Adele R. Levy Fund, Inc., New York, N.Y.	Manet	Oysters.
Do	Redon	Pansies.
Lady Roxana Vereker, Valbonne, France.	Carpenter	Mrs. Henry C. Bowen.
Miss Martha E. Warner, Paoli, Pa.	Bass Otis	John Smith Warner.
Mrs. E. Laurence White, Prides Crossing, Mass.	Lydia Emmet	Mother and Children.

SCULPTURE

Donor	*Artist*	*Title*
Samuel H. Kress Foundation, New York, N.Y.	Solari	The Man of Sorrows.
Do	North Italian School, 1321.	Madonna and Child Enthroned with Angels.
Do	Michelozzi	Madonna with the Sleeping Child.
Do	Nino Pisano	The Archangel Gabriel.
Do	----do	The Virgin Annunciate.
Do	French School, first half, 14th century.	Madonna and Child.
Do	Sansovino	Andiron with Figure of Mars.
Do	----do	Andiron with Figure of Venus.
Do	Bernini	Monsignor Francesco Barberini.
Do	Giovanni di Turino.	Madonna and Child.
Do	Italian School, first half, 17th century.	Chiaro da Verrazano.
Do	----do	Giovanni da Verrazano.
Do	Vittoria	Portrait of a Young Knight.
Do	----do	Portrait of a Venetian Lady.
Lessing J. Rosenwald, Jenkintown, Pa.	Daumier	Le Petit Propriétaire.
Do	----do	Le Visiteur.

DECORATIVE ARTS

Samuel H. Kress Foundation, New York, N.Y.	15 enamels.	
The Tunisian People, Tunisia.	Roman Mosaic, 3d century A.D.	Symbols of Bacchus as God of Wine and the Theater.

GRAPHIC ARTS

During the year Copley Amory gave an engraving entitled *The Copley Family* by Copley. Seventy-four objects in niello were given by the Samuel H. Kress Foundation, and Lessing J. Rosenwald increased his gift to the Gallery with 84 prints and drawings.

OTHER GIFTS

In the fiscal year 1962 gifts of money were made by the Old Dominion Foundation, Avalon Foundation, Mrs. Mellon Bruce, Calouste Gulbenkian Foundation, Miss Martha E. Warner, and Irving R. Saal. An additional cash bequest was received from the estate of William Nelson Cromwell. Gifts of securities during the year were received from the estate of Ferdinand Lammot Belin and from Mrs. Mildred G. Bryan.

EXCHANGE OF WORKS OF ART

In exchange for one-third interest in the "Geese Book," a medieval choral missal, the Samuel H. Kress Foundation gave the National Gallery of Art 200 antique frames.

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.	----------	53 objects of Pre-Columbian art.
Chester Dale, New York, N.Y.	Bellows	Blue Morning.
Do	Monet	The Seine at Giverny.
Col. and Mrs. Edgar W. Garbisch, New York, N.Y.	Unknown	4th Pennsylvania Cavalry.
Mr. and Mrs. David Lloyd Kreeger, Washington, D.C.	Van Gogh	Vase of Flowers.
Do	Monet	Water Lilies.
Do	Renoir	Bather.
Mrs. Eugene Meyer, Washington, D.C.	Dufresne	Still Life.
Do	Renoir	Nude.

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.	----------	111 objects of Pre-Columbian art.
Chester Dale, New York, N.Y.	Bellows	Blue Morning.
Do	Monet	The Seine at Giverny.
Col. and Mrs. Edgar W. Garbisch, New York, N.Y.	Chambers	New York Harbor with Small Sailing Vessel.
Do	Unknown	4th Pennsylvania Cavalry.
Mr. and Mrs. David Lloyd Kreeger, Washington, D.C.	Van Gogh	Vase of Flowers.
Do	Monet	Water Lilies.
Do	Renoir	Bather.
Samuel H. Kress Foundation, New York, N.Y.	Basaiti	Madonna and Child.
Mrs. Eugene Meyer, Washington, D.C.	Dufresne	Still Life.
Do	Renoir	Nude.

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.	Unknown	Jonathan Benham.
Do	Joseph Badger	Mrs. Isaac Foster.
Do	Unknown	Catharine Hendrickson.
Do	----do	The Start of the Hunt.
Do	----do	The End of the Hunt.
Do	----do	The Sargent Family.
Do	Earl	Family Portrait.
Do	Unknown	Alice Slade.
Do	----do	Joseph Slade.
Do	----do	General Washington on White Charger.
Do	Bundy	Vermont Lawyer.
Do	Unknown	Blue Eyes.
Do	----do	The Hobby Horse.
Do	John Bradley	Little Girl in Lavender.
Do	Susanne Walters	Memorial to Nicholas M. S. Catlin.
Do	Linton Park	Flax Scutching Bee.
Do	Unknown	Mahantango Valley Farm.
Do	----do	Civil War Battle Scene.
Do	Hofmann	Berks County Almshouse.
Art Institute of Chicago, Chicago, Ill.	Eakins	Monsignor Diomede Falconio.
Do	----do	The Biglen Brothers Racing.
Department of Defense, Washington, D.C.	Murray	James V. Forrestal.
Philadelphia Museum of Art, Philadelphia, Pa.	Eakins	Monsignor Diomede Falconio.
Do	----do	The Biglen Brothers Racing.
Century 21 Exposition, Seattle, Wash.	Copley	Epes Sargent.
Texas Technological College, Lubbock, Tex.	Earl	Andrew Jackson.
The White House, Washington, D.C.	----	22 sketches for WPA murals.
Wilmington Society of the Fine Arts, Wilmington, Del.	Unknown	Village by the River.
Woodlawn Plantation, Mount Vernon, Va.	Polk	General Washington at Princeton.

EXHIBITIONS

The following exhibitions were held at the National Gallery of Art during the fiscal year 1962:

Chinese Art Treasures. Sponsored by the Government of the Republic of China. Continued from previous fiscal year through August 13, 1961.

Early American Lighting Devices. From the Index of American Design. Continued from previous fiscal year through July 12, 1961.

Exhibitions of recent accessions. Roman mosaic, third century A.D. "Symbols of Bacchus as God of Wine and the Theater," May 4, 1961, through August 25, 1961; "Girl with a Basket of Fish" and "Girl with a Basket of Oranges" by Renoir, August 30, 1961, through September 26, 1961; "A Young Girl Reading" by Fragonard, November 21, 1961, through March 22, 1962; "Pansies" and "Wildflowers" by Redon, January 5, 1962, through January 24, 1962; "The Copley Family" by Copley, May 11, 1962, through June 8, 1962; and "Oysters" by Manet, June 22, 1962, to continue into the next fiscal year.

Lithographs and etchings by Goya. From the Rosenwald Collection. July 13 through September 13, 1961.

Etchings and drawings by Giovanni Battista Tiepolo and *Giovanni Domenico Tiepolo.* From the Rosenwald and W. G. Russell Allen Collections. September 15, 1961, through November 2, 1961.

Tiepolo Drawings. From the Victoria and Albert Museum, London. September 17 through October 15, 1961.

French XVIIIth century color prints. From the Widener Collection. October 7, 1961, through November 6, 1961.

A Retrospective Exhibition of the Work of Thomas Eakins. From 57 collections and private lenders. October 8, 1961, through November 12, 1961.

Tutankhamun Treasures. From the Department of Antiquities of the United Arab Republic. November 3, 1961, through December 3, 1961.

Art Treasures for America. From the Samuel H. Kress Collection. December 10, 1961, through February 1, 1962.

Christmas prints. From the Rosenwald Collection. December 14, 1961, through January 24, 1962.

Early American Glass. From the Index of American Design. January 25, 1962, through May 24, 1962.

English Drawings and Water Colors. From British Collections, sponsored by the English-Speaking Unions of the United States and the British Commonwealth, and from the Collection of Mr. and Mrs. Paul Mellon. February 18, 1962, through April 1, 1962.

English mezzotints. From the Rosenwald Collection. February 17, 1962, through April 1, 1962.

Lithographs by George Bellows. From the Mellon, Rosenwald, and Addie Burr Clark Memorial Collections. April 21, 1962, to continue into the next fiscal year.

Prints with color. From the Rosenwald Collection. May 25, 1962, to continue into the next fiscal year.

Exhibition of the Collection of Mr. and Mrs. André Meyer. June 10, 1962, 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 35 museums, universities, schools, and art centers in the United States and abroad.

Index of American Design.—During the fiscal year 1962, 28 traveling exhibitions (865 plates and 34 lithographs) were circulated in this country to 14 States, the District of Columbia, and in Canada and Germany.

CURATORIAL ACTIVITIES

Under the direction of Dr. Perry B. Cott, chief curator, the curatorial department accessioned 291 gifts to the Gallery during the fiscal year 1962. Advice was given with respect to 1,586 works of art brought to the Gallery for expert opinion and 24 visits to collections were made by members of the staff in connection with offers of gifts. About 4,435 inquiries, many of them requiring research, were answered verbally and by letter.

Miss Elizabeth Mongan, curator of graphic arts, lectured on graphic arts at Bryn Mawr College, Bryn Mawr, Pa., Cheltenham, England, and Beaver College, Pa. She gave a course in graphic arts to six seniors from Bryn Mawr College at Alverthorpe Gallery, Jenkintown, Pa., October through January. She was on the jury of selection for the Print Club of Philadelphia and for American Prints Today, Print Council of America.

Dr. H. Lester Cooke, curator of painting, lectured on modern art at the Corcoran Gallery of Art, Washington, D.C., and the Indiana Club of Washington, D.C. He also gave two lectures to the Italian Society of Washington. During the year Dr. Cooke assisted in judging the following art shows: Mid-States Annual, Evansville, Ind.; Miniature Society of America, Smithsonian Institution, Washington, D.C.; annual art exhibition of Charles County, Md.; and the Indian Head Art Society annual exhibition, Indian Head, Md.

The Richter Archives received and cataloged over 679 photographs on exchange from museums here and abroad, 96 purchased photographs, and about 1,000 reproductions. Five hundred photographs were added to the Iconographical Index.

RESTORATION

Francis Sullivan, resident restorer of the Gallery, made regular and systematic inspection of all works of art in the Gallery and on loan to Government buildings in Washington, and periodically removed dust and bloom as required. He relined, cleaned, and restored 12 paintings and gave special treatment to 26. Twenty paintings were X-rayed as an aid in research. Experiments were continued with synthetic materials suggested by the National Gallery of Art Fellowship at the Mellon Institute of Industrial Research, Pittsburgh, Pa. Technical advice on the conservation of paintings was furnished the public upon request, and advice on and special treatment were given to works of art belonging to other Government agencies, including the White House, U.S. Capitol, U.S. Coast Guard, and the Supreme Court.

Mr. Sullivan made trips to various cities in connection with the loan of paintings to the Gallery for special exhibitions. He also attended a conference in Rome, Italy, on "Recent Advances in Conser-

vation" sponsored by the International Institute for Conservation and, while in Europe, met with conservators in London, Paris, Amsterdam, and Brussels.

PUBLICATIONS

William P. Campbell, assistant chief curator, wrote the notes for the catalog of the exhibition *Retrospective Exhibition of the Work of Thomas Eakins.*

Miss Elizabeth Mongan, curator of graphic arts, wrote an article for the Print Council of America Year Book entitled "Battle of Fornovo."

Dr. H. Lester Cooke, curator of painting, wrote an article on the development of Winslow Homer's watercolor technique for the *Art Quarterly*, Summer 1961.

Dr. Katharine Shepard, assistant curator of graphic arts, wrote a book review for the *American Journal of Archaeology* for January 1962 on "Romische Funde" by Hans von Hülsen.

During the fiscal year 1962 the Publications Fund placed seven catalogs on sale: *Tiepolo Drawings from the Victoria and Albert Museum, London; Thomas Eakins, A Retrospective Exhibition; Tutankhamun Treasures; Kress Gift to the Nation; English Drawings and Water Colors from British Collections; English Drawings and Water Colors from the Collection of Mr. and Mrs. Paul Mellon;* and *Exhibition of the Collection of Mr. and Mrs. André Meyer.* Four books were placed on sale also: *Art Treasures for America*, an anthology of painting and sculpture from the Samuel H. Kress Collection; *Paintings of the World's Great Galleries*, with a section on the National Gallery of Art by Perry B. Cott; *The Collected Dialogues of Plato* edited by Edith Hamilton and Huntington Cairns; and *Of Divers Arts* by Naum Gabo, the A. W. Mellon Lecturer in the Fine Arts for 1959. Other material made available included 6 large color reproductions, a variety of jewelry pieces made from 6 small sculptures, 10 color filmstrips on the Gallery collection produced by Encyclopaedia Britannica, and 2 sets of playing cards reproducing Gallery subjects.

Sixteen color postcards and one 11″ by 14″ color reproduction of the new Fragonard "A Young Girl Reading" were published, together with 51 new 2″ by 2″ color slides. The Christmas cards included seven new color subjects and nine new graphic arts selections.

EDUCATIONAL PROGRAM

The program of the educational department 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 works of art in the Gallery's collection.

Attendance for the general tours, tours of the week, and picture of the week talks totaled 41,314. This represents an increase of 2,475 over last year's attendance. The attendance at the Sunday afternoon auditorium lectures totaled 10,668.

Special tours, lectures, and conferences were arranged and a total of 16,006 were served in this manner. This is an increase over last year of 1,918 persons. These included groups of visitors from Government agencies, club and study groups, foreign students, religious organizations, 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 special instruction was given to approximately 100 volunteers from the Junior League of Washington and the American Association of University Women. By special arrangement with the public and parochial schools of the District of Columbia and surrounding counties of Maryland and Virginia, these volunteers conducted tours for 59,989 children, an increase of 8,069 children over last year's total.

Forty-one lectures were delivered in the auditorium on Sunday afternoons. Five of these were delivered by staff members, and 30 by guest lecturers. Kathleen Raine delivered the Eleventh Annual Series of the Andrew W. Mellon Lectures in the Fine Arts on six consecutive Sundays beginning on March 4 on the subject "Wisdom of the Ages: A Study of the Traditional Sources of William Blake."

The slide library of the educational department has a total of 44,274 slides in its permanent and lending collections. During the year 2,244 slides were added to the collections. In all, 250 persons borrowed a total of 11,229 slides from the collections. It is estimated these slides were seen by 20,780 viewers.

Members of the staff participated in outside activities delivering lectures, teaching courses, and attending classes in foreign universities. Also members of the staff prepared scripts for the Lectour recordings and for radio talks and wrote the material used in the school tour program and the slide lending program.

A printed calendar of events was prepared and distributed monthly to a mailing list of about 9,300 names. This is an increase over last year of 1,747 names.

EXTENSION SERVICES

The extension service continued under the direction of the curator of the Index of American Design, Dr. Grose Evans. This service circulates to the public the traveling exhibits, Gallery films, and slide lecture sets. There are 26 traveling exhibits in circulation, lent free of charge except for transportation charges. These were circulated in 156 bookings and were seen by an estimated 78,000 viewers. Three

special exhibits were prepared by special request and circulated. Preparation was begun on a program to circulate exhibits in the school systems of New York state.

Three films were circulated in 139 bookings and were seen by an estimated 41,700 viewers. A total of 930 sets of slide lectures on a variety of subjects were circulated in 2,019 bookings and seen by approximately 121,150 viewers. The extension services this year reached approximately 240,850 persons, an increase over last year of 88,870.

LIBRARY

During the year the library, under the supervision of Miss Ruth Carlson, accessioned 4,397 publications of which 3,955 were received by exchange, as gifts, or purchased from private funds. Government funds were used to purchase 13 books and 26 subscriptions to periodicals, and for the binding of 188 volumes of periodicals. In all, 1,279 photographs were added this year and were acquired by exchange or by purchase from private funds.

During the year the library classified and cataloged 1,667 publications, 6,384 cards were filed, and 2,517 periodicals were recorded. There were 8,781 periodicals circulated, and 3,622 books borrowed by members of the staff. This year the library sold 9 duplicate books and disposed of 500 periodicals to the United States Book Exchange. A total of 1,483 books and 4 microfilms were borrowed on interlibrary loan.

The exchange program became a library function during the year and 570 National Gallery of Art publications were distributed.

The library maintains a stock of black-and-white photographs of works of art in the Gallery's collections. These are maintained for the use of the staff, for exchange, for reproduction in approved publications and for sale to the public. Approximately 6,108 photographs were stocked in the library during the year and 1,243 orders for 6,014 photographs were filled. There were 366 permits for reproduction of 1,319 subjects processed.

INDEX OF AMERICAN DESIGN

The Index of American Design under the supervision of Dr. Grose Evans circulated 106 sets of color slides (5,306) throughout the country; and 230 photographs of Index material were used for exhibits, study, publicity, and reproduction in approved publications. The photographic file was increased by 69 negatives and 260 prints. Twenty-eight permits to reproduce 103 subjects from the Index were issued.

The material in the Index of American Design was studied during the year by 458 persons doing special research and for publication, exhibition, and use by designers.

The curator of the Index of American Design took part again in the orientation program of USIA personnel and delivered 8 lectures to approximately 251 people on American folk art. He also delivered five lectures to school and club groups. Dr. Evans conducted a series of 45 television lectures on the history of painting.

MAINTENANCE OF BUILDING AND GROUNDS

The Gallery building, mechanical equipment, and grounds were maintained at the established standards throughout the year.

A new security system, protecting all exterior entrances and exits, was installed jointly by the Gallery staff and the Federal Engineering Co. This system provides for the sounding of an alarm in the National Gallery of Art Guard Office simultaneously with the sounding of an alarm at the Federal Engineering Co. headquarters, should any of the exterior doors, windows, or exterior ducts be opened during specified periods.

Specially designed acoustic tile was installed in the compressor room to lower the sound level as a protection for the hearing of employees working in that area.

An additional sprinkler system, tied in with the ADT alarm system, was installed in the unfinished area, G–15, on the ground floor.

The Gallery greenhouse continued to produce flowering and foliage plants in quantities sufficient for all decorative needs of special openings and day-to-day requirements of the Garden Courts.

The planting of zoysia grasses in exposed lawns and parking strips continued. After experimentally determining that Emerald zoysia is apparently hardy under Gallery conditions, the planting of this strain is being undertaken in all areas which were not previously planted with Meyer zoysia or zoysia matrella.

LECTOUR

The Gallery's electronic guide system, Lectour, was increased by over 50 percent in September 1961, when 11 new rooms were added to the 20 already wired for broadcast. This additional equipment makes it possible for the first time for visitors to have the benefit of Lectour in the Gallery's collection of decorative art on the ground floor.

During the fiscal year 1962 Lectour was used by 87,736 visitors.

Lectour broadcasts were prepared for the special exhibitions of the Kress Gift to the Nation, Eakins Retrospective Exhibition, and English Drawings and Water Colors.

OTHER ACTIVITIES

Forty Sunday evening Calouste Gulbenkian Foundation concerts were given in the East Garden court. The National Gallery of Art

orchestra conducted by Richard Bales played 10 of these concerts. Two were made possible in part by the Music Performance Trust Fund of the American Federation of Musicians. The National Gallery Strings, conducted by Mr. Bales, furnished music during the Thomas Eakins opening on October 7, 1961, and at the opening of English Water Colors on February 17, 1962. The concert on Sunday, October 22, 1961, was dedicated to United Nations Day. Five consecutive Sunday evenings during May and June were devoted to the Gallery's 19th American Music Festival. All concerts were broadcast by Station WGMS–AM and FM in stereophonic sound. Washington music critics covered the concerts. Intermission talks during the broadcasts were delivered by members of the Educational Department staff on works of art in the Gallery, and on music by Mr. Bales. During the season Mr. Bales and the National Gallery orchestra played a number of engagements outside the Gallery's regular programs. Two hour-long television programs of the National Gallery orchestra with Mr. Bales conducting were shown on WTOP. Mr. Bales received an award for his outstanding contributions to American music from the Academy of Achievement, Monterey, Calif., and the National Gallery of Art received an Award of Merit from the National Federation of Music Clubs for its participation in the performance of American music.

In response to requests, 27,268 copies of the pamphlet "A Cordial Invitation from the Director" and 2,264 copies of the Gallery's information booklet were sent to members of Congress and to organizations holding conventions in Washington, D.C.

Henry B. Beville, the head of the Gallery's photographic laboratory, and his staff processed 26,661 items including negatives, prints, color transparencies, color separations, and slides.

A total of 232 permits to copy works of art and 124 permits to photograph works of art were issued.

AUDIT OF PRIVATE FUNDS OF THE GALLERY

An audit of the private funds of the Gallery will be made for the fiscal year ended June 30, 1962, by Price Waterhouse & Co., public accountants. A report of the audit will be forwarded to the Gallery.

Respectfully submitted.

HUNTINGTON CAIRNS, *Secretary.*

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Report on the 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, 1962:

The library continued to furnish pertinent literature and information in support of the various programs and activities of the Institution.

ACQUISITIONS

Publications received during the year totaled 84,061. In this number are represented 2,475 purchased books, subscriptions to 826 journals, and publications received as gifts and exchanges. In cooperation with scientific and learned organizations throughout the world, 83 new exchanges were established. In addition, approximately 1,750 volumes, which had been specially requested by staff members, were received.

Outstanding gifts from interested donors provided the library with many valuable and difficult to locate publications. Some of these include:

The Encyclopedia Americana, the 1829 and the 1962 Seattle World's Fair editions, from the Americana Corp., New York. Accepted by Dr. Leonard Carmichael in a special ceremony in the Board of Regents Room, May 1, 1962.

342 items on architecture and town planning, from Elbert Peets, Washington, D.C.

Collection of scientific publications, from W. J. Hammer (bequest).

Scottish Art Review, vols. 1–7, from J. Ramsay, Braidwood, Glasgow, Scotland.

Price lists, catalogs, books, and pamphlets on the history of dentistry, from Edward H. Angle (bequest).

The Melander collection of 262 volumes on Diptera, from Dr. J. F. Gates Clarke, U.S. National Museum.

"Fan Leaves," by Fan Guild of Boston, from Mrs. Frank C. Doble, Belmont, Mass.

41 volumes on mechanical and civil engineering, from Mrs. Carolyn H. Edwards, Glen Echo, Md.

5 books on weapons, from Mrs. John Oliver LaGorce, Washington, D.C.

"Primitive into Painter," by William B. O'Neal, from the author, Charlottesville, Va.

Relación de Michoacán, 1541 (facsimile), from His Excellency Mariano de Yturralde y Orbegoso, the Ambassador of Spain, Washington, D.C.

17 volumes on ceramics and glass, from Dr. Hans Syz, Westport, Conn.

34 volumes on physical sciences, from the U.S. Naval Observatory Library.

Collection of journals, from Mrs. DeWitt C. Ramsay, Washington, D.C.
4 trade catalogs, from C. V. S. Roosevelt, Washington, D.C.

In conjunction with the library's exchange program, a total of 32,055 pieces of duplicate and extraneous materials were sent to other libraries. This included 26,717 items forwarded to the Library of Congress and 2,481 dissertations sent to the National Library of Medicine.

In all, 116,116 pieces of material were handled by the acquisitions section during the year.

REFERENCE AND CIRCULATION

The reference librarians answered 30,498 requests for specific types of information, replied to 3,441 pieces of correspondence, circulated 33,704 books and journals, and cleared the loan records of 26,269 volumes. No circulation record is maintained of those books and journals assigned to divisional libraries. Publications borrowed from other libraries, chiefly the Library of Congress, totaled 5,386; approximately 1,503 volumes were lent. The number of persons using the reading and reference facilities of the central and branch libraries totaled 24,423, an increase of 9,903 over the previous year. Additional funds enabled the library to purchase seriously needed reference and bibliographical materials.

CATALOGING AND BINDING

The organization and control of the library's collection are necessary to provide an effective library program for the staff of the Institution.

The catalog section cataloged 6,564 volumes, recataloged 344 volumes, transferred 537 volumes, recorded 29,967 serials in the Serial Record, and filed 34,568 cards into the card catalog.

The binding unit prepared 6,400 volumes of books and journals for binding by a commercial binder. The Editorial and Publications Division designed end papers to be used for all newly bound or rebound books and journals, which attractively indicate Smithsonian ownership. The skilled hand-binding staff preserved 3,049 volumes and pamphlets which were either too fragile or valuable to be sent outside the Institution for repair. This program, to preserve our valuable research and source materials, continues on a rewarding basis.

PROGRAMS AND FACILITIES

The library staff continued to develop and put into practice new procedures, routines, and form letters which provided more efficient and expeditious operations. In the central library, for example, 45,000 volumes were rearranged and filed in one sequence on the shelves. Such improvements are important to the functioning of the library as a whole.

During the year the library staff assisted in the Smithsonian exhibition program by conducting extensive research to provide background information and appropriate illustrations for proposed exhibits.

Careful consideration was given to the efficient and economic arrangement of space and equipment in the library's allotted area in the east and west ranges in the Natural History Building. Floor plans were made for the library of the National Collection of Fine Arts and the National Portrait Gallery in the Patent Office Building.

A Xerox 914 book copier was acquired for the purpose of extending library services. This quick photocopying equipment provides the research staff with library materials that are needed for long-term use, particularly those that are out of print and/or difficult to locate.

STAFF CHANGES AND ACTIVITIES

Mrs. Etta C. Bachrach, formerly with the National Library of Medicine, joined the catalog section staff in April. Miss Janice Brown, chief of the reference and circulation section, retired on May 18.

During the year, staff members attended the International Conference on Cataloguing Principles sponsored by UNESCO in Paris, France, the American Library Association's annual conference, the American Library Association's Library Buildings and Equipment Institutes, the Special Libraries Association's conference, and U.S. Book Exchange meetings. Staff members also visited the Bibliothèque National in Paris and the Library for the National Portrait Gallery in London.

BRANCH LIBRARIES

The branch library for the Museum of History and Technology answered 13,327 reference questions, circulated 12,847 books and journals, and provided assistance to 5,591 visitors to the library. The trade catalog collection was enriched by the addition of 816 commercial catalogs, many of which are rare and out of print. A concentrated effort is being made to organize this collection prior to its move into the new Museum of History and Technology building. A twice-monthly accessions list was continued with gratifying results.

The importance of the Bureau of American Ethnology branch library's valuable collection of materials on the North American Indians was recognized by steps taken during the year toward making this better available to Smithsonian and visiting scientists. The physical appearance and lighting arrangements were improved, and Mrs. Carol F. Jopling, formerly with the U.S. Information Agency, was appointed as librarian.

Procedures were put into effect for the operation of the branch library of the Smithsonian Astrophysical Observatory in Cambridge,

Mass. The acquisition of all library materials for SAO is conducted by the central library, but the materials are delivered directly to Cambridge where the cataloging is performed. This procedure makes books and journals available more rapidly to the SAO staff than was heretofore possible. Approximately 5,625 visitors availed themselves of this library, 905 books and journals were circulated, and 275 reference questions were answered.

The division of insects branch library of approximately 18,000 volumes was moved to Lamont Street in April, along with the division itself and the U.S. Department of Agriculture Insect Identification Branch.

SUMMARIZED STATISTICS

ACCESSIONS

	Volumes	Total recorded volumes, 1962
Smithsonian Central Library including the Museum of Natural History	2,623	345,931
Museum of History and Technology	2,959	
Astrophysical Observatory (SI)	4	13,404
Smithsonian Astrophysical Observatory, Cambridge, Mass.	296	1,700
Radiation and Organisms	170	2,039
Bureau of American Ethnology	289	39,180
National Air Museum	135	951
National Collection of Fine Arts	86	14,391
National Zoological Park	1	4,297
Science Information Exchange	1	1
Total	6,564	421,894

Unbound volumes of periodicals and reprints and separates from serial publications, of which there are many thousands, have not been included in the above totals.

Exchanges:	
New exchanges arranged	83
Specially requested publications received	1,750
Cataloging:	
Volumes cataloged	7,445
Catalog cards filed	34,568
Serials: Number of serials recorded	29,967
Circulation: Loans of books and periodicals	33,704
Binding and Repair:	
Volumes sent to the bindery	6,400
Volumes repaired in the library	3,049

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, 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 12 Smithsonian Miscellaneous Collections papers; 1 Annual Report of the Board of Regents and separates of 21 articles in the General Appendix; 1 Annual Report of the Secretary; 2 special publications; and reprints of 3 publications.

The U.S. National Museum issued 1 Annual Report, 4 bulletins, 5 papers in the series Contributions from the U.S. National Herbarium, 10 papers in the series Contributions from the Museum of History and Technology, and 12 Proceedings papers.

The Bureau of American Ethnology issued 1 Annual Report and 3 Bulletins.

The Astrophysical Observatory issued 4 papers in the series Smithsonian Contributions to Astrophysics.

The Smithsonian Traveling Exhibition Service, under the National Collection of Fine Arts, published 5 catalogs.

DISTRIBUTION

Requests for publications and information continued to show a substantial increase during the year. The publications distribution

section, under the immediate direction of Mrs. Eileen M. McCarthy, received 37,609 requests for publications from foreign and domestic libraries, universities, research institutions, educational establishments, and individuals throughout the world. Visitors to the office and replies to inquiries numbered 28,938.

A total of 817,695 copies of publications and miscellaneous items were distributed: 26 Contributions to Knowledge; 34,396 Smithsonian Miscellaneous Collections; 7,801 Annual Report volumes and 33,210 pamphlet copies of Report separates; 48,328 special publications; 244 reports of the Harriman Alaska Expedition; 60,473 publications of the National Museum; 19,326 publications of the Bureau of American Ethnology; 21,276 publications of the National Collection of Fine Arts; 526 publications of the Freer Gallery of Art[1]; 21 Annals of the Astrophysical Observatory; 7,674 Smithsonian Contributions to Astrophysics publications; 789 War Background Studies; 3,349 reports of the American Historical Association; and 5,800 publications not issued by the Smithsonian Institution. Miscellaneous items: 3 sets of North American Wild Flowers and 162 North American Wild Flower prints; 23 Pitcher Plant volumes; 60,384 Guide Books; 17,919 picture pamphlets; 320,441 postcards, 122,753 postcard folders, 18,267 color slides; 122,753 information leaflets; 372 statuettes; 3,761 View-master reels.

The distribution section assisted also in the distribution to libraries of three titles published as a result of the Institution's participation in the translation program of the National Science Foundation: Studies on Crustacea of the Red Sea, part 1, by O. Paul'son; Fauna of U.S.S.R.: Birds, vol. 2, No. 3, Charadriiformes, Suborder Alcae, by E. V. Kozlova; and Ecology of Sea Colony Birds of the Barents Sea, by L. O. Belopol'skii.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

In this series, under the immediate editorship of Miss Ruth B. MacManus, there were issued 12 papers as follows:

Volume 142

No. 2. Folk religion in Southwest China, by David C. Graham. 246 pp., 28 pls., 10 figs. (Publ. 4457.) November 1, 1961. ($4.)

No. 4. Cenozoic and Cretaceous echinoids from Trinidad and Venezuela, by C. Wythe Cooke. 35 pp., 14 pls. (Publ. 4459.) August 18, 1961. ($1.25.)

Volume 143

No. 3. Supplement to the annotated, subject-heading bibliography of termites, 1955–1960, by Thomas E. Snyder. 137 pp. (Publ. 4463.) December 29, 1961. ($1.50.)

[1] In addition to those distributed by the Gallery itself.

No. 4. Comparison of tektite specimens from Empire, Georgia, and Martha's Vineyard, Massachusetts, by Roy S. Clarke, Jr., and Maxwell K. Carron. 18 pp., 6 pls. (Publ. 4465.) August 24, 1961. (60 cents.)

No. 5. A long-range temperature forecast, by C. G. Abbot. 46 pp., 5 figs. (Publ. 4471.) October 27, 1961. (75 cents.)

No. 6. The caterpillar and the butterfly, by R. E. Snodgrass. 51 pp., 17 figs. (Publ. 4472.) November 3, 1961. (75 cents.)

No. 7. The organization and probable evolution of some mixed species flocks of Neotropical birds, by M. Moynihan. 140 pp. (Publ. 4473.) March 5, 1962. ($1.50.)

Volume 144

No. 1. A further study of the lower Eocene mammalian faunas of southwestern Wyoming, by C. Lewis Gazin. 98 pp., 14 pls., 2 figs. (Publ. 4474.) January 17, 1962. ($1.50.)

No. 2. Dimensional relationships for flying animals, by Crawford H. Greenewalt. 46 pp., 17 figs. (Publ. 4477.) April 6, 1962. ($2.)

No. 3. Revision of the cassiduloid echinoids, by Porter M. Kier. 262 pp., 44 pls., 184 figs. (Publ. 4500.) June 26, 1962. ($5.)

Volume 145

No. 1. Systematic notes concerned with the avifauna of Panama, by Alexander Wetmore. 14 pp. (Publ. 4501.) June 26, 1962. (30 cents.)

No. 2. Notes on fossil and subfossil birds, by Alexander Wetmore. 17 pp., 2 figs. (Publ. 4502.) June 26, 1962. (30 cents.)

SMITHSONIAN ANNUAL REPORTS

REPORT FOR 1960

The complete volume of the Annual Report of the Board of Regents for 1960 was received from the printer on October 4, 1961:

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, 1960. x+605 pp., illus. (Publ. 4435.)

The general appendix contained the following papers (Publ. 4436–4456):

The science of yesterday, today, and tomorrow, by W. F. G. Swann.

The origin and nature of the moon, by Harold C. Urey.

Exploring the solar system by radar, by Paul E. Green, Jr., and Gordon H. Pettengill.

Digital computers: Their history, operation, and use, by E. M. McCormick.

Navigation—from canoes to spaceships, by Charles S. Draper.

Photography of the ocean floor, by A. S. Laughton.

History of a tsunami, by Elliott B. Roberts.

Hailstorms and hailstones of the western Great Plains, by Vincent J. Schaefer.

The 1959–60 eruption of Kilauea Volcano, by Donald H. Richter and Jerry P. Eaton.

Diamonds, by H. J. Logie.

Seeing the magnetization in transparent magnetic crystals, by J. F. Dillon, Jr.

Biophysics of bird flight, by August Raspet.

Animal societies, from slime molds to man, by R. E. Snodgrass.
Luminescence in marine organisms, by J. A. C. Nicol.
Trumpets in the West, by William B. Morse.
Problems involved in the development of clam farms, by Harry J. Turner, Jr.
The growth of cotton fiber science in the United States, by Arthur W. Palmer.
Rice—Basic food for one-third of the earth's people, by Raymond E. Crist.
The River Basin salvage program: After 15 years, by Frank H. H. Roberts, Jr.
New World prehistory, by Gordon R. Willey.
The art of Seth Eastman, by John Francis McDermott.

REPORT FOR 1961

The report of the Secretary, which will form part of the 1961 Annual Report of the Board of Regents, was issued January 25, 1962.

Report of the Secretary and financial report of the Executive Committee of the Board of Regents for the year ended June 30, 1961. x+236 pp., 14 pls. (Publ. 4475.)

SPECIAL PUBLICATIONS

European military museums, by J. Lee Westrate. 206 pp., 13 pls. (Publ. 4432.) [July 17] 1961. ($4.)

Smithsonian publications available for distribution December 31, 1960. 46 pp. (Publ. 4464.) [July 12] 1961.

REPRINTS

The First Ladies Hall, by Margaret W. Brown [Klapthor]. (Revised.) 12 pp., illus. (Publ. 4212.) [Oct. 15] 1961. (25 cents.)

Solar variations and weather, by Charles Greeley Abbot. 48 pp., illus. (Publ. 4505.) [May 4, 1962.] (50 cents.) Reprinted from "The Sun and the Welfare of Man," volume 2 of the Smithsonian Scientific Series, pp. 138–182, 1943.

Smithsonian Mathematical Tables: Hyperbolic functions, prepared by George F. Becker and C. E. Van Orstrand. (7th reprint.) lii+321 pp. (Publ. 1871.) August 25, 1961. ($5.)

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, 1961. Pp. viii+188, illus. January 25, 1962.

BULLETINS

216, part 3. Ichneumon-flies of America north of Mexico: 3. Subfamily Gelinae, Tribe Mesostenini, by Henry and Marjorie Townes. Pp. viii+602, 400 figs. Mar. 13, 1962.

222. John Baptist Jackson: 18th-century master of the color woodcut, by Jacob Kainen. Pp. xii+183, illus. 101 (12 in color). June 1, 1962.

224. Robber flies of the world: The genera of the family Asilidae, by Frank M. Hull. Pp., pt. 1, x+430, pt. 2, v+431–907. June 25, 1962.

225. Contributions from the Museum of History and Technology, papers 12–18, by members of the staff and others:

Paper 17. The effect of Bacon's Rebellion on government in England and Virginia, by Wilcomb E. Washburn. Pp. 135–152, 8 figs. February 16, 1962.

Paper 18. Excavations at Rosewell in Gloucester County, Virginia, 1957–1959, by Ivor Noël Hume. Pp. 153–229, 38 figs. May 24, 1962.

228. Contributions from the Museum of History and Technology, papers 19–30, by members of the staff and others:

Paper 21. The pioneer steamship *Savannah:* A study for a scale model, by Howard I. Chapelle. Pp. 61–80, 9 figs. Sept. 15, 1961.

Paper 22. Drawings and pharmacy in al-Zahrāwī's 10th-century surgical treatise, by Sami Hamarneh. Pp. 81–94, 21 figs. Oct. 10, 1961.

Paper 23. The introduction of self-registering meteorological instruments, by Robert P. Multhauf. Pp. 95–116, 16 figs. Sept. 6, 1961.

Paper 24. Introduction of the locomotive safety truck, by John H. White. Pp. 117–131, 12 figs. Sept. 5, 1961.

Paper 25. The migrations of an American boat type, by Howard I. Chapelle. Pp. 133–154, 20 figs. Nov. 6, 1961.

Paper 26. Holcomb, Fitz, and Peate: Three 19th-century American telescope makers, with introduction by Robert P. Multhauf. Pp. 155–184, 15 figs. Jan. 15, 1962.

Paper 27. Kinematics of mechanisms from the time of Watt, by Eugene S. Ferguson. Pp. 185–230, 46 figs. Feb. 14, 1962.

Paper 28. The development of electrical technology in the 19th century: 1. The electrochemical cell and the electromagnet, by W. James King. Pp. 231–271, 71 figs. Jan. 15, 1962.

232. The lithographs of Childe Hassam, a catalog, by Fuller Griffith. Pp. vii+66, 45 figs. June 29, 1962.

CONTRIBUTIONS FROM THE NATIONAL HERBARIUM

Volume 35

Part 3. Origins of the flora of southern Brazil, by Lyman B. Smith. Pp. viii+215–249, 42 figs., 4 pls. Mar. 19, 1962.

Part 4. A synopsis of the American Velloziaceae, by Lyman B. Smith. Pp. 251–292, 12 pls. Mar. 19, 1962.

Part 5. Synopsis of the South American species of *Vismia* (Guttiferae), by Joseph Ewan. Pp. 293–377, 7 pls. June 5, 1962.

Volume 36

Part 2. Marine algae from the tropical Atlantic Ocean: V. Algae from the Lesser Antilles, by William Randolph Taylor. Pp. 43–62, 4 pls. Jan. 31, 1962.

Volume 37

Part 1. Studies of Pacific island plants, XVII: The genus *Geniostoma* (Loganiaceae) in the New Hebrides, Fiji, Samoa, and Tonga, by Albert C. Smith and Benjamin C. Stone. Pp. 1–41, 3 pls. Jan. 5, 1962.

PROCEEDINGS

Volume 112

No. 3449. Revision of the marine silver hatchetfishes (family Sternoptychidae), by Leonard P. Schultz. Pp. 587–649, 26 figs. Sept. 7, 1961.

Title page, table of contents, and index. Pp. i–vii, 651–677. Feb. 14, 1962.

Volume 113

No. 3453. Notes on Australian flies of the family Conopidae, by Sidney Camras. Pp. 61–76. Aug. 1, 1961.

No. 3454. New and previously known millipeds of Panama, by H. F. Loomis. Pp. 77–123, 8 figs. Aug. 16, 1961.

No. 3455. New genera and new species of lacebugs from the Eastern Hemisphere (Hemiptera: Tingidae), by Carl J. Drake and Florence A. Ruhoff. Pp. 125–183, 24 figs. Aug. 1, 1961.

No. 3456. The weevil genus *Smicronyx* in America north of Mexico (Coleoptera: Curculionidae), by Donald M. Anderson. Pp. 185–372, 157 figs., 1 pl. May 31, 1962.

No. 3457. Neotropical Microlepidoptera, I and II, by J. F. Gates Clarke. Pp. 373–388, 9 figs. Apr. 30, 1962.

No. 3458. Two new species of *Parastenocaris* (Copepoda: Harpacticoidea) from Santa Catarina, Brazil, by Hans Jakobi and Jayme de Loyola e Silva. Pp. 389–397, 2 figs. June 5, 1962.

No. 3460. Water-striders of the subgenus *Stridulivelia* from Mexico, Central America, and the West Indies (Hemiptera: Veliidae), by Carl J. Drake and Arnold S. Menke. Pp. 413–419, 3 pls. June 19, 1962.

No. 3462. New and little-known species of South and Central American land snails (Bulimulidae), by Juan José Parodiz. Pp. 429–456, 2 pls. June 4, 1962.

No. 3463. *Gorgonolaureus*, a new genus of ascothoracid barnacle endoparasitic in Octocorallia, by Huzio Utinomi. Pp. 457–464, 9 figs. June 19, 1962.

No. 3464. Larvae of the caddis-fly genus *Rhyacophila* in eastern North America (Trichoptera: Rhyacophilidae), by Oliver S. Flint, Jr. Pp. 465–493, 11 figs. May 31, 1962.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

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

Seventy-eighth Annual Report of the Bureau of American Ethnology, 1960–61. ii+33 pp., 2 pls. 1962.

Bulletin 175. Mohave ethnopsychiatry and suicide: The psychiatric knowledge and the psychic disturbances of an Indian tribe, by George Devereux. vi+586 pp., 10 pls. 1961.

Bulletin 179. River Basin Surveys Papers, Nos. 21–24, Frank H. H. Roberts, Jr., editor. xviii+337 pp., 56 pls., 43 figs. 1961.

No. 21. Excavations at Texarkana Reservoir, Sulphur River, Texas, by Edward B. Jelks.

No. 22. Archeological investigations at the Coralville Reservoir, Iowa, by Warren W. Caldwell.

No. 23. The McNary Reservoir: A study in Plateau archeology, by Joel L. Shiner.

No. 24. The Sheep Island site and the Mid-Columbia Valley, by Douglas Osborne, Alan Bryan, and Robert H. Crabtree.

Bulletin 183. Seneca Thanksgiving rituals, by Wallace L. Chafe. iii+302 pp. 1961.

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. 4. Precision orbits of 413 photographic meteors, by Luigi G. Jacchia and Fred L. Whipple. Pp. 97–129, 6 figs. 1961. (Corrected edition.)

Volume 5

No. 9. Rotation of an earth satellite in flight along its orbit, by Yusuke Hagihara. Pp. 113–143, 5 figs. 1961.

No. 10. Sampling dust from the stratosphere, by Paul W. Hodge. Pp. 145–152, 2 figs., 2 pls. 1961.

No. 11. On the Λ and Φ operators of radiative transfer theory, by S. S. Kumar. Pp. 153–185, 8 figs. 1962.

PUBLICATIONS OF THE NATIONAL COLLECTION OF FINE ARTS

The following catalogs were issued by the Smithsonian Traveling Exhibition Service during the year:

Drawings by sculptors. 16 pp., illus. 1961.

Belgian drawings from Ensor to Delvaux. 32 pp., illus. 1961.

Tutankhamun treasures. 46 pp., illus. 1961.

Tiepolo drawings from the Victoria and Albert Museum, London. 32 pp., illus. 1961.

Smithsonian Institution traveling exhibitions. 1962–63 catalog. 70 pp.

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 1960. Vol. 1. Proceedings. 1961.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN REVOLUTION

In accordance with law, the manuscript of the sixty-fourth annual report of the National Society, Daughters of the American Revolution, was transmitted to Congress on March 6, 1962.[1]

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[1] D.A.R. reports are published as Senate documents and are not available from the Smithsonian Institution.

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, and served on its executive committee. He also represented the Institution at the annual meeting of the Association of American University Presses held in June at Palo Alto, Calif.

A noteworthy item in press at the close of the year was an "Author-Subject Index to Articles in Smithsonian Annual Reports, 1849–1961," compiled and edited under the direction of the editorial and publications division.

The division, as well as other branches of the Institution, cooperated with the National Science Foundation during the year in the preparation of No. 13 of the Foundation's series of bulletins describing the policies and practices of Federal agencies relative to their scientific and technical information activities. This bulletin, on the scientific information activities of the Smithsonian Institution, was published by the Foundation in June.

Respectfully submitted.

PAUL H. OEHSER,
Chief, Editorial and Publications Division.

Dr. LEONARD CARMICHAEL,
Secretary, Smithsonian Institution.

Other Activities

LECTURES

In 1931 the Smithsonian 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 28th Arthur lecture was delivered in the auditorium of the Natural History Building on the evening of May 8, 1962, by Dr. Martin Schwarzschild, Eugene Higgins professor of astronomy, Princeton University. His subject was "Astronomical Photography from the Stratosphere."

Lt. Gen. James H. Doolittle, USAF (Ret.), delivered the third Lester D. Gardner lecture, on "Early Blind Flying," in the auditorium of the Natural History Building on the evening of September 28, 1961. This lecture was published in full in the general appendix of the Annual Report of the Board of Regents of the Smithsonian Institution for 1961 (pp. 337–355).

Dr. Rodney Young, professor of classical archaeology, University of Pennsylvania, lectured on "Gordion on the Royal Road" in the auditorium of the Natural History Building on the evening of February 8, 1962. This was sponsored jointly by the Smithsonian Institution and the Archaeological Institute of America.

Several lectures were sponsored by the Freer Gallery of Art and the National Gallery of Art. These are listed in the reports of these bureaus.

SCIENCE INFORMATION EXCHANGE

The Science Information Exchange receives, organizes, and disseminates information on scientific research in progress. Its mission is to facilitate planning and management of scientific research activities supported by Government and non-Government agencies and institutions by promoting the exchange of information that concerns subject matter, distribution, level of effort, and other data pertaining to current research in the prepublication stage. It helps program directors and administrators to avoid unwanted duplication and to determine the most advantageous distribution of research funds. It serves the entire scientific community by informing individual in-

vestigators about who is currently working on problems in their special fields. Funds for the operation of the Science Information Exchange were provided by the principal Federal agencies served.

This year the Exchange was reorganized and expanded to undertake the registration of research in the physical sciences in addition to the established program in the biological, medical, and social sciences. This expansion, projected over 18 months, involves the reorganization of the Exchange, the acquisition of enlarged computer facilities, a professional staff for the new physical sciences division, and a program for a systems analysis and control intended to coordinate efficiently the complex operational procedures.

The new physical sciences division is being organized around an initial collection of basic and applied research records in the fields of chemistry, physics, mathematics, earth sciences, materials, and electronics. Five specialists now form the nucleus of this staff. About 4,000 projects have been registered. The acquisition of another 3,000 to 4,000 records over the next few months will afford a fairly representative sample of Government research in these research specialties.

The life sciences division has had 12 years of successful operation in biology, medicine, psychology, and social sciences and continues to expand the scope and volume of its collection and services at a healthy rate. About 56,000 records of research proposals, awards, and contracts were received this year. About half a million copies of research records were selected and sent out in response to requests for information. Five new staff members were added to this division during the year.

Dr. Stella Leche Deignan resigned as director of the Exchange in September to take a position with the National Institutes of Health. Dr. Monroe E. Freeman was appointed director to succeed her. Dr. David Hersey became associate director for the life sciences division. Harvey Marron was appointed assistant director for operations.

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 Lindsay, curator, is carried in the Report on the U.S. National Museum (pp. 38–40).

The Museum Service provided assistance to professional groups and individuals visiting the museums of the Institution or planning to

do so. Assistance in the form of lectures, answers to inquiries, and special tours of certain museum areas was rendered to college and 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. Mr. Lindsay served as consultant on museum organization and practices to representatives from other museums on several occasions.

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 5-day program outlining the history of the Institution and the work of the various Smithsonian museum and research bureaus was presented to 42 graduate students from the University of Maryland. This workshop has, since its inception in 1958, provided an opportunity for more than 200 local school teachers and university faculty members to become acquainted with cultural resources of the Institution of value in school curricula.

A radio lecture system has been installed in nine halls and in the rotunda of the Museum of Natural History, under the direction of the Museum Service. These lectures, written by the assistant curator, Mrs. Sophy D. Burnham, in cooperation with the various subject specialists involved, provide background information about the 34 major areas of the halls included in the system.

The Museum Service cooperated with WTOP–TV to produce the television program "The World of Mammals" and with WMAL–TV to produce the television film "The History of the Smithsonian Institution." It also arranged for loans of objects to the Greater Washington Educational Television Association for several of their educational television programs and for spot announcements of the Junior League guided tours 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 a visiting group from the Perkins Institute for the Blind, Watertown, Mass.

Mrs. Janet Stratton of the Museum Service staff directed the installation of the exhibit "Jazz Memorabilia," shown in the rotunda of the Arts and Industries Building in connection with the Jazz Festival sponsored by the President's Music Committee of the People-to-People program.

The program for visitor orientation to Smithsonian Museums was continued through the installation of two floor plans and directories

placed in the original Smithsonian building, one at the north door and the other at the east door. In addition, signs were placed in the Natural History Building announcing special exhibits.

A 6-week summer training program for high school students, organized by Mrs. Arthur Goldberg and the Urban Service Corps, has been established. Its purpose is to acquaint the students with the location and content of the Smithsonian exhibits and the work of the Institution so that they may acquaint small groups of their contemporaries with the exhibits of the Institution.

A great many slides were added to the slide lending library, and two slide lectures were prepared, one on "The Smithsonian Institution" and the other on "Some Possessions of George Washington in the Smithsonian Institution."

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 this Report. Mailing lists for announcements of these events were maintained and kept current.

The Smithsonian Calendar of Events, a listing of special events of the Institution, was prepared and distributed monthly.

The curator attended the Annual Winterthur Seminars in Museum Operation and Connoisseurship held at Winterthur, Del., in May 1962; the annual meeting of the Museum Stores Association held at the Munson-Williams-Proctor Institute in Utica, N.Y., and the Corning Museum of Glass, Corning, N.Y., in May 1962; and the annual meeting of the American Association of Museums held in Williamsburg, Va., in June 1962. Mrs. Burnham, the assistant curator, when in Europe in March 1962 visited the British Museum; British Museum of Natural History; Science Museum, South Kensington; Victoria and Albert Museum; Riikjks Museum, Amsterdam; Palais de la Decouverte; Musée de l'Homme; Unesco Museum Documentation Center; Jeu de Paume, Louvre, Paris. She also attended the annual meeting of the American Association of Museums held in June in Williamsburg.

Mr. Lindsay traveled to Providence, R.I., to consult with the director and trustees of the Old Slater Mill and to the Youth Museum at Savannah, Ga., regarding various administrative problems of these museums.

Report of the Executive Committee of the Board of Regents of the Smithsonian Institution

For the Year Ended June 30, 1962

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 1962*
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 $4,147,562.65 which has been invested. Of this sum, $3,969,482.90 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 1962	Income 1962
Abbott, W. L., Special	$22,522.34	$1,174.27
*Avery, Robert S., and Lydia	59,712.30	3,113.28
Gifts, royalties, gain on sale of securities	417,403.46	21,762.48
Hachenberg, George P., and Caroline	6,079.80	316.99
*Hamilton, James	610.23	31.80
Hart, Gustavus E	736.34	38.40
Henry, Caroline	1,828.34	95.34
Henry, Joseph and Harriet A	74,105.83	3,863.72
*Hodgkins, Thomas G. (General)	45,793.92	2,387.59
Morrow, Dwight W	116,900.22	6,094.91
Olmsted, Helen A	1,211.99	63.21
*Poore, Lucy T. and George W	246,039.46	12,827.93
Porter, Henry Kirke	432,950.15	22,573.05
*Rhees, William Jones	715.22	37.30
*Sanford, George H	1,345.68	70.14
*Smithson, James	1,845.53	96.44
Taggart, Gansen	540.68	28.17
Witherspoon, Thomas A	195,089.23	10,171.54
Total	1,625,430.72	84,746.56

*In addition to funds deposited in the United States Treasury.

CONSOLIDATED FUND

(Income restricted to specific use)

Fund	Investment 1962	Income 1962
Abbott, William L., for investigations in biology	$157, 601. 60	$8, 217. 01
Armstrong, Edwin James, for use of Department of Invertebrate Paleontology when principal amounts to $5,000	1, 898. 60	94. 07
Arthur, James, for investigations and study of the sun and annual lecture on same	60, 459. 26	3, 152. 23
Bacon, Virginia Purdy, for traveling scholarship to investigate fauna of countries other than the United States	75, 738. 96	3, 948. 88
Baird, Lucy H., for creating a memorial to Secretary Baird	54, 057. 76	1, 897. 70
Barney, Alice Pike, for collection of paintings and pastels and for encouragement of American artistic endeavor	43, 358. 91	2, 260. 62
Barstow, Frederick D., for purchase of animals for Zoological Park	1, 511. 33	78. 77
Canfield collection, for increase and care of the Canfield collection of minerals	57, 819. 33	3, 014. 59
Casey, Thomas L., for maintenance of the Casey collection and promotion of researches relating to Coleoptera	18, 948. 75	987. 94
Chamberlain, Francis Lea, for increase and promotion of Isaac Lea Collection of gems and mollusks	42, 571. 13	2, 219. 58
Dykes, Charles, for support in financial research	65, 085. 37	3, 393. 41
Eickemeyer, Florence Brevoort, for preservation and exhibition of the photographic collection of Rudolph Eickemeyer, Jr	16, 431. 70	856. 73
Hanson, Martin Gustav and Caroline Runice, for some scientific work of the Institution, preferably in chemistry or medicine	13, 439. 14	700. 71
Higbee, Harry, income for general use of the Smithsonian Institution after June 11, 1967	48. 56	1. 49
Hillyer, Virgil, for increase and care of Virgil Hillyer collection of lighting objects	9, 935. 35	518. 01
Hitchcock, Albert S., for care of the Hitchcock Agrostological Library	2, 385. 43	124. 39
Hrdlička, Aleš and Marie, to further researches in physical anthropology and publication in connection therewith	76, 090. 74	3, 770. 58
Hughes, Bruce, to found Hughes alcove	28, 936. 60	1, 508. 70
Johnson, E. R. Fenimore, research in underwater photography	10, 546. 65	522. 63
Loeb, Morris, for furtherance of knowledge in the exact sciences	131, 751. 73	6, 869. 23
Long, Annette and Edith C., for upkeep and preservation of Long collection of embroideries, laces, and textiles	820. 82	42. 80
Maxwell, Mary E., for care and exhibition of Maxwell collection	29, 651. 40	1, 545. 94

CONSOLIDATED FUND—continued

Fund	Investment 1962	Income 1962
Myer, Catherine Walden, for purchase of first-class works of art for use and benefit of the National Collection of Fine Arts	$30, 535. 47	$1, 592. 04
Nelson, Edward W., for support of biological studies	33, 618. 85	1, 752. 79
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, 452. 37	75. 70
Pell, Cornelia Livingston, for maintenance of Alfred Duane Pell collection	11, 205. 62	584. 25
Petrocelli, Joseph, for the care of the Petrocelli collection of photographic prints and for the enlargement and development of the section of photography of the U.S. National Museum	11, 206. 92	584. 30
Rathbun, Richard, for use of division of U.S. National Museum containing Crustacea	16, 078. 72	838, 30
*Reid, Addison T., for founding chair in biology, in memory of Asher Tunis	26, 889. 37	1, 401. 97
Roebling Collection, for care, improvement, and increase of Roebling collection of minerals	182, 448. 20	9, 512. 42
Roebling Solar Research	25, 908. 78	1, 425. 07
Rollins, Miriam and William, for investigations in physics and chemistry	215, 074. 58	10, 928. 64
Smithsonian employees' retirement	35, 185. 27	1, 851. 54
Springer, Frank, for care and increase of the Springer collection and library	27, 109. 61	1, 413. 41
Strong, Julia D., for benefit of the National Collection of Fine Arts	15, 115. 01	788. 07
Walcott, Charles D. and Mary Vaux, for development of geological and paleontological studies and publishing results of same	724, 193. 35	37, 719. 87
Walcott, Mary Vaux, for publications in botany	87, 506. 96	4, 562. 40
Younger, Helen Walcott, held in trust	117, 024. 81	6, 027. 49
Zerbee, Francis Brinckle, for endowment of aquaria	1, 433. 98	74. 76
Total	2, 461, 076. 99	126, 859. 03

* In addition to funds deposited in the United States Treasury.

FREER GALLERY OF ART FUND

Early in 1906, by deed of gift, Charles L. Freer, of Detroit, gave to the Institution his collection of Chinese and other Oriental objects of art, as well as paintings, etchings, and other works of art by Whistler, Thayer, Dewing, and other artists. Later he also gave funds for construction of a building to house the collection, and finally in his will, probated November 6, 1919, he provided stocks and securities to the estimated value of $1,958,591.42, as an endowment fund for the operation of the Gallery. The fund now amounts to $10,089,088.74.

SUMMARY OF ENDOWMENTS

Invested endowment for general purposes	$2,514,430.72
Invested endowment for specific purposes other than Freer endowment	2,633,131.93
Total invested endowment other than Freer	5,147,562.65
Freer invested endowment for specific purposes	10,089,088.74
Total invested endowment for all purposes	15,236,651.39

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	$1,478,884.02	
Stocks	2,594,012.40	
Real estate and mortgages	57,506.00	
Uninvested capital	17,160.23	4,147,562.65
Total investments other than Freer endowment		5,147,562.65
Investment of Freer endowment (cost or market value at date acquired):		
Bonds	$5,055,130.47	
Stocks	5,023,175.83	
Uninvested capital	10,782.44	10,089,088.74
Total investments		15,236,651.39

EXHIBIT A

BALANCE SHEET OF PRIVATE FUNDS

June 30, 1962

ASSETS

Current funds:		
General:		
Cash:		
United States Treasury current account		$777,833.49
In banks and on hand		417,888.82
		1,195,722.31
Travel and other advances		17,680.35
Total general funds		1,213,402.66
Restricted:		
Cash—United States Treasury current account	$2,569,147.45	
Investments—stocks and bonds (quoted market value $1,619,839.07)	1,635,712.56	
Total restricted funds		4,204,860.01
Total current funds		5,418,262.67

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EXHIBIT A—Continued

ASSETS—continued

Endowment funds and funds functioning as endowment:			
Investments:			
Freer Gallery of Art:			
Cash		$10,782.44	
Stocks and bonds (quoted market value $13,306,202.51)		10,078,306.30	
		10,089,088.74	
Consolidated:			
Cash	$16,880.03		
Stocks and bonds (quoted market value $4,696,018.45)	3,952,602.87		
	3,969,482.90		
Loan to United States Treasury	1,000,000.00		
Other stocks and bonds (quoted market value $143,894.75)	120,293.55		
Cash	280.20		
Real estate at book value	57,506.00	5,147,562.65	
Total endowment funds and funds functioning as endowment			15,236,651.39
Total			20,654,914.06

FUND BALANCES

Current funds:			
General:			
Unexpended funds—unrestricted			$1,213,402.66
Total general funds			1,213,402.66
Restricted (Exhibit C):			
Unexpended income from endowment		$1,210,899.50	
Funds for special purposes (gifts, grants, etc.)		2,993,960.51	
Total restricted funds			4,204,860.01
Total current funds			5,418,262.67
Endowment funds and funds functioning as endowment (Exhibit D):			
Freer Gallery of Art		$10,089,088.74	
Other:			
Restricted	$2,633,131.93		
General	2,514,430.72	5,147,562.65	
Total endowment funds and funds functioning as endowment			15,236,651.39
Total			20,654,914.06

EXHIBIT B

PRIVATE FUNDS

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS AND CHANGES IN CURRENT GENERAL FUND BALANCES

Year ended June 30, 1962

	Operations	Publications	Gifts and grants
Current receipts:			
Endowment income:			
Freer Gallery of Art	$437, 961. 29		
Other restricted funds	64, 905. 35		
Unrestricted	138, 086. 56		
Investment income	66, 007. 78		
Gifts and grants, including administrative overhead	214, 440. 80		$6, 074, 087. 84
Publications and photographs		$108, 251. 13	
Miscellaneous	9, 266. 44		
Appropriated from endowment fund	325. 53		
Total current receipts	930, 993. 75	108, 251. 13	6, 074, 087. 84
Current expenditures:			
Salaries:			
Administrative	125, 382. 46		
Research	19, 717. 71		2, 589, 259. 57
Other	185, 385. 66		
Total salaries	330, 485. 83		2, 589, 259. 57
Purchase for collection	140, 568. 30		
Researches and exploration and related administrative expenses:			
Travel	17, 264. 74		
Equipment and supply	4, 644. 55		
Other	9, 890. 90		3, 484, 828. 27
Publications and photographs	40, 015. 86	51, 296. 65	
Buildings, equipment, and grounds:			
Buildings and installations	19, 190. 93		
Court and grounds maintenance	742. 11		
Technical laboratory	2, 404. 57		
Contractual services—custodian and legal fees	23, 109. 21		

EXHIBIT B—Continued

PRIVATE FUNDS—Continued

STATEMENT OF CURRENT GENERAL FUND RECEIPTS AND DISBURSEMENTS AND CHANGES IN CURRENT GENERAL FUND BALANCES—continued

Year ended June 30, 1962—Continued

	Operations	Publications	Gifts and grants
Current expenditures—Continued			
Salaries—Continued			
Supplies and expenses:			
Meetings, special exhibits	$17, 112. 96	----------	----------
Lectures	3, 063. 57	----------	----------
Photographs and reproductions	5, 679. 83	----------	----------
Library	4, 056. 35	----------	----------
Sales desk	15, 386. 14	----------	----------
Stationery and office supplies	105. 27	----------	----------
Postage, telephone, and telegraph	212. 57	----------	----------
Employees' withholding payments, net	(753. 61)	----------	----------
Total current expenditures	633, 180. 08	51, 296. 65	6, 074, 087. 84
Excess of current receipts over current expenditures	297, 813. 67	56, 954. 48	354, 768. 15
Balance at beginning of year	----------	----------	858, 634. 51
Balance at end of year	----------	----------	1, 213, 402. 66

EXHIBIT C

PRIVATE FUNDS

STATEMENT OF CHANGES IN CURRENT RESTRICTED FUND BALANCE

Year ended June 30, 1962

	Unexpended income	Funds for special purposes (gifts, grants, etc.)	Total
Balance at beginning of year	$1,084,076.28	$2,290,370.27	$3,374,446.55
Add:			
Income from restricted endowment:			
Freer Gallery of Art	470,093.22		470,093.22
Other restricted funds	273,011.96		273,011.96
	743,105.18		743,105.18
Less custodial costs	31,119.62		31,119.62
Net income from restricted endowment	711,985.56		711,985.56
Sale of publications	36,329.31	619.30	36,948.61
Gifts and grants		6,676,997.94	6,676,997.94
Other	4,762.85	252,054.13	256,816.98
Transfer from endowment funds, net		1,381.69	1,381.69
	1,837,154.00	9,221,423.33	11,058,577.33
Deduct:			
Transfer to current income, net of custodial cost:			
Freer Gallery of Art	407,917.14		407,917.14
Other restricted funds	63,829.88	6,074,087.84	6,137,917.72
Unrestricted	138,086.56		138,086.56
	609,833.58	6,074,087.84	6,683,921.42
Transfer		159,626.14	159,626.14
Income added to principal, net	10,169.76		10,169.76
Transfer to (from) gifts and grants	6,251.16	(6,251.16)	
	626,254.50	6,227,462.82	6,853,717.32
Balance at end of year	1,210,899.50	2,993,960.51	4,204,860.01

EXHIBIT D

PRIVATE FUNDS

STATEMENT OF CHANGES IN PRINCIPAL OF ENDOWMENT FUNDS AND FUNDS FUNCTIONING AS ENDOWMENT

Year Ended June 30, 1962

Balance at beginning of year		$14,592,560.72
Add:		
Gifts and bequests (including transfer of Johnson Fund)	$56,340.53	
Income added to principal as prescribed by donor	10,169.76	
Net gain on investments	586,454.75	652,965.04
		15,245,525.76
Deduct:		
Amount transferred to gifts and grants for Roebling Fund	8,548.84	
Amount appropriated to current funds for retirement payments	325.53	8,874.37
		15,236,651.39
Balance at year end consisting of:		
Unrestricted	2,514,430.72	
Restricted for:		
Freer Gallery of Art	10,089,088.74	
Other collections and research	2,633,131.93	
	15,236,651.39	

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 $10,986.45.

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:

A. P. Smith Manufacturing Corporation, a gift to the Marine Archeology Fund.

Academic Press, a contribution to the Rathbun Fund.

American Cocoa Research Institute, a grant to defray costs of art work in connection with a monograph of the genus *Theobroma*.

American Council of Learned Societies, a grant for participation in the International Congress on the Antiquity and Origin of Man in the Americas.

American Philosophical Society, a grant for support of research on the Oklahoma Seneca Cayuga Indians.

Appalachian Power Co., a grant to cover preliminary archeological surveys in the Smith Mountain Reservoir Area on the Roanoke River.

Atomic Energy Commission:

A grant for the support of research entitled "A Study of the Biochemical Effects of Ionizing and Nonionizing Radiation on Plant Metabolism during Development."

A grant for the support of research entitled "Systematic Zoological Research on the Marine Fauna of the Tropical Pacific Area."

Lucy H. Baird, bequest for the Spencer Fullerton Baird Fund.

Laura Dreyfus Barney, a gift to finance the publication of the catalog of the Barney Collection.

Laura Dreyfus Barney and Natalie Clifford Barney, additional interest in Barney Studio House (aggregate of two quarterly shares received).

Charles and Rosanna Batchelor Memorial Incorporated, a grant for the purpose of improving the Emma E. Batchelor stamp collection.

Bredin Foundation, additional grant for the support of research entitled "Ocean Food Chain Cycle."

Mrs. M. P. Bryon, a gift for the purchase of historic items for the National Aeronautical Collection.

Bureau of Naval Weapons, grant for procurement of changes incidental to construction of the scale model of the A–I Airplane.

Mrs. J. Campbell, a contribution to the Zoo Animal Fund.

Department of the Air Force:

Additional grant for upper atmosphere stellar image study.

Additional grant for research directed toward providing a program for use with an I.B.M. 704 Computer for determination of satellite density data.

Additional grant for the study of "Atmospheric Entry and Impact of High Velocity Meteorites."

Additional grant for research directed toward the study of stellar scintillation.

Additional grant for research directed toward the studies of rate of accretion of interplanetary matter by the earth.

Department of the Army:

A grant for support of research entitled "Potential Vectors and Reservoirs of Disease in Strategic Overseas Areas."

A grant for the support of research entitled "Mammals and their Ectoparasites from Ethiopia."

Additional grant for research entitled "Procurement of Satellite Tracking and Orbit."

Eastern Federation of Gem and Minerals Societies, fund for inspection of an exhibit of gems and minerals.

Embassy of Guatemala, a gift for investigating a fossil vertebrate occurrence near Zacapa.

Felix and Helen Juda Foundation, a gift to the Freer Gallery of Art for the purchase of collections.

Fred Maytag Family Foundation, a gift to the Marine Archeology Fund.

General Atomic Division, a gift to the Meteorite Fund.

Goodman Manufacturing Co., a gift for the purchase of the Benard Mining Prints.

For purchase of the Harleton Texas Meteorite:

Brookhaven Laboratory
Carnegie Institute of Technology
University of California
University of Chicago
University of Kentucky

Harvard University, a grant for Symposium of Evolution of Crustacea.

International Association for Dental Research, gift for research in Physical Anthropology.

Edwin A. Link, a gift to the Marine Archeology Fund.

Link Foundation, a grant for the support of special publications on aviation.

Mrs. Ethel B. McCay, a gift for the purchase of postal history material.

National Aeronautics and Space Administration:

Additional grant for the support of research entitled "Optical Satellite Tracking Program."

Additional grant for the scientific and engineering study for instrumenting and orbiting telescope.

Additional grant for research on the motion of artificial satellites.

National Geographic Society, additional grant for Paleo-Indian investigations at Agate Basin, Eastern Wyoming.

National Institutes of Health, a grant for the support of research enitled "Studies of Asian Biting Flies."

National Science Foundation:

Grant for the support of research entitled "Ordovician Gastropods of Norway and a Comparison of American and European Ordovician Gastropods."

Additional grant for the support of research entitled "Monographic Studies of the Family Tingidae."

Grant for the support of research entitled "Morphology and Paleoecology of the Permian Brachiopods of the Glass Mountains, Texas."

Additional grant for the support of research entitled "Endocrine Basis of Parasitic Breeding of Birds."

Grant for the support of research entitled "The Flora of Fiji."

Grant for the support of research entitled "Mammals of Southeastern United States."

Additional grant for the support of research entitled "Tertiary Forests of the Tonasi–Santiago Basin of Panama."

Additional grant for the support of research entitled "Phanerogams of Colombia."

Additional grant for the support of research entitled "South Asian Microlepidophers, Particularly the Philippine Series."

Additional grant for the support of research entitled "A Monograph of the Lichen Genus *Parmalia*."

Grant for the support of research entitled "Permo–Triassic Reptiles of South Africa."

Additional grant for the support of research entitled "Comparative Analysis of Behavior in Tropical Birds."

Grant for the support of research entitled "The Mammals of Panama."

Additional grant for the support of research entitled "Revisionary Study of the Blattoidea."

Additional grant for the support of research entitled "Taxonomy of the Bamboos: Redefinition of the Genera."

Grant for the support of research entitled "Stellar Atmospheres."

Grant for the support of research entitled "Settlement Patterns in the Missouri Valley."

Grant for the support of research entitled "Caddo Language Study."

Grant for the support of research entitled "A Late Pleistocene Fauna and Possible Human Associations near Littleton, Colorado."

Grant for the support of research entitled "Oldest Fossil Bryozoa of the United States."

Grant for the support of research entitled "Taxonomy of Bamboos."
Grant for the support of research entitled "Systematics and Distribution of North American Calanoid and Harpacticoid Copepoda."
Grant for the support of research entitled "Scientific Community in England, 1820–1860."
Grant for the support of research entitled "Photoresponses and Optical Properties of Phycomyces Sporangiophores."
Grant for the support of research entitled "Ecology and Behavior of *Suncus murinus*."
Grant for the support of research entitled "Paramo Flora of Northeastern Peru."
Grant for the support of research entitled "Taxonomy of the Genus *Swartzia*."
Grant for the support of research entitled "Foreign Cambrian Trilobites with American Affinities."
Grant for support of research entitled "Systematic Significance of Echinoid Spines."

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."
Additional grant for studies concerning the development of a proposal for an institute for laboratory of human performance standards.
Additional grant for research in connection with studies on the marine fauna of the South Pacific Ocean.
Additional grant to perform psychological research studies.
Additional grant to perform aeronautical research studies.
Grant for research on biological community interrelationships and to record observations of behavior on film.
Additional grant to provide expert consultants to advise the Navy Advisory Committee.
Grant for support of research studies on the Microlepidoptera of the Island of the mosquitoes of the world.
Grant for support of research studies on the Microlepidoptera of the Island of Rapa.
Grant for support of research entitled "A Study of Anatomy and Taxonomy of Hawaiian Woods."

B. T. Rocca, gift for the purchase of a geological specimen.
American Association of Museums through Rockefeller Brothers Fund, a grant to cover insurance on the Egyptian Collection to be exhibited by Smithsonian Institution Traveling Exhibition Service.
For the 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 Institutes of Health
National Science Foundation
Veterans' Administration
St. Petersburg Shell Club, fund for inspection of an exhibit of shells.
Philip M. Stern, a gift for animal shipment.
Chauncey Stillman, a gift for the restoration of a landau presented to the Smithsonian Institution by Mr. Stillman.

Tucson Gem and Mineral Society, fund for inspection of an exhibit of gems and minerals.

United States Information Agency, a grant for the support of the Third International Exhibition of Contemporary Ceramics held in Prague, Czechoslovakia.

United Van Lines, a gift to the Meteorite Fund.

University of West Indies, Trinidad, fund for Neotropical Botany Conference in Trinidad.

Villanova University, a gift for the special Paleontological Fund.

Woods Hole Oceanographic Institution, a grant for research cruise from Cape Sable, Nova Scotia, to Trinidad.

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1962:

Salaries and Expenses	$9,125,000.00
National Zoological Park	1,387,600.00

The appropriation made to the National Gallery of Art (which is a bureau of the Smithsonian Institution) was $1,932,000.00.

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	$231,705.00

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, 1962, 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 administered by the Institution under Federal appropriations. The accounts of the Institution are maintained on the basis of cash receipts and disbursements, with the result that the accompanying statements do not reflect income earned but not collected or expenses incurred but not paid.

In our opinion, subject to the matters referred to in the preceding paragraph, the accompanying statement of private funds presents fairly the assets and funds principal of Smithsonian Institution at June 30, 1962; 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 17, 1962

Respectfully submitted:

(S) CLARENCE CANNON
(S) CARYL P. HASKINS
(S) ROBERT V. FLEMING
Executive Committee.

ZOOLOGICAL